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SECURITY, CLIMATE CHANGE, AND THE RESOURCE NEXUS

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Almost every January we observe a nearly annual ritual of running and reading stories in major media outlets, government reports, and science blogs declaring the previous year to be either the hottest on record, globally, or among the warmest. Add to this common story those on topics such as weather volatility, record high local temperatures, Arctic sea ice levels, glacial and Antarctic icecap retreat, and a picture of popular coverage of our changing climate begins to emerge. Less covered on page one of major newspapers or the nightly news is the steadily growing concern among security analysts and scientists from many disciplines about the myriad linkages between climate change and national, international, local, and human security. To such concerns we must now add – and integrate – the resource nexus approach and the governance challenges it presents.

“Security” is often called an essentially contested concept. Its various meanings and their implications cannot be resolved into a single conceptualization – rather like “sustainable development,” in fact. Instead, the term security is often preceded by one of many modifiers, including “national,” “international,” “global,” or “human.” More traditional conceptualizations are generally said to relate to national and state security, while broader and newer conceptualizations often focus either on international or global scale framings, on the one hand, or on individuals and communities, on the other hand. In recent years, human security has emerged as a commonly used term to denote the broad inclusion of individuals’ and communities’ physical, economic, and social well-being within a security framework. The term now often encompasses issues denoted by popular concepts like food security, water security, and health security, and it often attends to gendered aspects of these issues, as well.

This chapter briefly presents major nodes of research and analysis around climate change and security linkages, around more recent attempts to link security to the resource nexus, and the need to position equity and justice-related concerns at the center of these complex perspectives. The chapter highlights a broad view of security at national, regional, and global scales, which span the traditional geopolitical definition to include perspectives on water, energy, and food securities as key elements of economic and physical security. It suggests that better and more integrative resource planning might alleviate some of these related stresses – stresses that traditional security analysis and research are also grappling with as geopolitics and resource conflicts receive increased attention. The chapter explores the role of climate change in increasing the challenges of responding to water and food security challenges, and considers the roles of trade

and localization in reducing those stresses. After the sections focused on the water-energy-food nexus across three scales – national, regional, and global – attention turns to an additional illustrative case focused on climate security and resource nexus connections in northwestern Kenya, where climate variability and scarce land and grassland resources increase the risks of lethal, inter-group violence. The Kenyan case illustrates what Andrews-Speed et al. (2015) called the “nexus on the ground.”

Climate change and security

The 1990s saw an acceleration of research and analysis – and a good deal of hypebole – about many possible connections between environmental change and security (Dabelko, 2008). Such work often focused attention on the connection between environmental change and violent conflict within and between states – often, it must be said, via a research focus on places where war was the known outcome. As scientific consensus about the growing threats posed by climate change stabilized and grew more certain, such research tended to focus, in particular, on the security impacts of climate change. In recent years, concern about the intersections of climate change and security – in terms of both traditional national and interstate security and a much broader human security agenda – resulted in a rapid proliferation of scholarly research and reports from think tanks, research institutes, national governments, and international organizations (Campbell et al., 2007; CNA, 2007; Andrews-Speed et al., 2015; Lee et al., 2012; Adger et al., 2014; Nordkvelle et al., 2017; Nett and Ruttinger, 2016). For example, related research and policymaking efforts have been seen within the UN system (including within both UNEP and the Security Council), NATO, the G7, the World Bank, a host of national foreign policy and security think tanks and institutes around the world, the US Department of Defense, Central Intelligence Agency, Department of State, and National Intelligence Council – to name only a few. A growing set of case studies, assessment and modeling exercises, and pilot programs have been produced, engendering a need for more systematic assessment of what is known and how this might be better integrated in the resource nexus framework. Certainly climate change threatens aspects of national, international, and human security in and among both wealthier, OECD countries and across nations and communities in the global south.

That climate change and security connections have achieved global, high-level scientific and policymaker attention is confirmed – and perhaps enhanced – by the inclusion of a “Human Security” chapter in the IPCC 5th Assessment report (Adger et al., 2014) and by the incorporation of climate change as a central theme in the 2014 US Department of Defense Quadrennial Defense Review (QDR) (USDOD, 2014). Together, these two documents illustrate that a diverse set of security threats, challenges, and frameworks are now connected to climate change trends, impacts, and implications. While the two documents are framed differently – with the QDR pitched primarily in terms of US national security and US interests around the world and the IPCC chapter more concerned with a broad human security agenda – both include themes related to national, international, and human security and both rely on largely overlapping sets of expertise and research. Many high-level US admirals and generals are now conversant in climate change impacts and their security implications, as are most NATO defense ministries, with some positioning climate change among the most important threats to international security in the coming years.

In fact, in 2016, a group of over 40 experts called “The Climate and Security Working Group”, including former US defense and foreign policymakers and many academics and think tank analysts, issues a report urging concrete action on over 75 enumerated items for the US White House, defense, foreign policy, energy, intelligence, and homeland security agencies

(CSAC, 2016). Even if the Trump administration ignores the recommendations, at least initially, the extensive list of suggested actions illustrates that this broad area of research and analysis has extensive policymaking implications. Certainly the US government is far from the only state to begin planning for and worrying about the dangerous implications of changing global, regional, and local climates. Attention to many states’ security planning processes, military spending patterns, border securitization efforts, energy policies and planning, and emergency and disaster response planning and investments suggest that threats posed by climate change are on the political agenda of many large and smaller states (Andrews-Speed et al., 2015).

As the IPCC “Human Security” chapter (Adger et al., 2014) makes clear, the causal pathways through which climate change connects to national, interstate, and human security concerns are myriad and often complex. While this research continues, it is clear through extensive, focused case study research and large-n quantitative analysis – stemming from a host of disciplinary backgrounds – that climate change poses a number of worrisome threats. The chapters’ review and assessment of existing research pays particular attention to climate change as a driver of human displacement, as a risk or threat multiplier of violent conflict (usually civil or inter-group violence) in part because it exacerbates poverty and economic volatility, and as an increasing threat to the integrity of critical state/public infrastructures and territorial integrity.

Security and the resource nexus

National and international security analysts have long been concerned about resource access, flows, and physical control of strategic resources such as coal, oil, food and arable land, minerals, uranium, rivers, seas, and so on (O’Sanya, 2015). Indeed, just about any resources considered essential for national or state survival or well-being can be “securitized” by analysts and/or policymakers. Not only is such securitized thinking about resources not new, it seems to date back at least as far as written records. Security analysis over the past decade or more revived concern about the role of resources scarcities and resource competition at multiple levels of scale, from local and national civil conflicts to increased prospects of great power resource wars (Klare, 2002, 2008, 2012). This work has often focused on the politics around oil, gas, and water and the particular territories (on land and at sea) in which these resources rest.

What is newer is the resource nexus perspective and the growing linkages between climate change and security. Like so much previous resource-related analysis, security planners, analysts, and practitioners tended to focus on security-related threats associated with one or two resources, at any given time. Growing human demand on resource flows and governance and accelerating climate change, however, reframe these security concerns (Andrews-Speed et al., 2015; VanDeveer, 2015). For example, a country or community dependent on some combination of fossil fuels and hydropower for electricity most be concerned about oil, gas, and coal extraction and supply; water availability and rainfall volatility, and a host of related minerals-, land-, food-, and water-quality issues. Traditionally, policymakers and analysts worried about governance aspects of particular resources in isolation, but increasing interlinkages between resource use, consumption, and demand calls this single-resource approach to governance and security analysis into question. So, for example, while energy geopolitics has a long history among security researchers and practitioners, they have paid little attention to the nexus between energy and other resources.

Security-related research has focused on resources such as water, energy, and minerals access and distribution. Interest now turns towards the need to more systematically assess resource nexus linkages to security-related aspects of climate change – its ecological and social impacts, as well as the implications of mitigation and adaptation policies (Adger et al., 2014; Dabelko et al.,

water shortage and drought may have played in escalating the early stages of the Syrian conflict (van der Heijden and Maddocks, 2015) abound: the intense droughts between 2006 and 2010 contributed to the heavy displacement of agricultural workers and drove them away from their rural farms and into cities before violent conflict erupted (Jaafar et al., 2015; IDMC, 2016). The recent Russian annexation of Crimea and the internal conflict in Ukraine, a strategically located transit state for natural gas and petroleum export from Russia to Europe, are often attributed to the Russian state's inclination to use of energy security as a political tool in the region (NATO, 2015). While debate rages about these example among analysts, each illustrates that resource politics are once again "high politics."

Such conflicts have implications for resource securities: insurgency and war are usually harmful to the political, economic, and social frameworks of communities. Agriculture and food production face significant losses due, in part, to increased food prices (Obersteiner et al., 2016), damaged assets and infrastructure, and disrupted supply chains (Flowers, K., 2015). Indeed, "food insecure populations are likely to express frustration with troubled regimes, perpetuating a cycle of political instability and further undermining long-term economic development" (Flowers, K., 2015). The overall impact of armed conflict on food production and food availability is significant in terms of public health risks and economic losses. The FAO estimated an average of \$4.3 billion in loss of agricultural output over a span of 27 years, due to war and conflict (FAO, 2002). The post-conflict dimension of resource security is often overlooked: food shortages tied to conflict often place countries in an extended state of food emergency long after the war or conflict has ended (Allouche, J., 2011; FAO, 2008). Also, food and water scarcity may well increase the risks of minerals exports disruption (Bleischwitz, Johnson and Dozier, 2013). The technological advancement and increased labor productivity in agriculture over the last two centuries, argues Allouche (2011), has made humankind notably resilient to water and food conflicts. In fact, datasets monitoring conflict reveal that only seven minor conflicts in the last century were linked to water resources (Bohmelt et al., 2014). Water and food insecurities are generally assumed to be issues of overconsumption and competition. However, the insecurity of these resources are more often a reflection of the politics of allocation and inequality (Allouche, J., 2011).

Stresses and levers for WEF security at multiple scales: national, regional, and global

This section identifies major stresses facing water, energy, and food securities at national, regional, and global scales. It highlights some of the main levers for alleviating these stresses and moves towards increased resilience at each scale (Figure 4.1). Climate change is a stressor across all scales. It affects water availability and agricultural yields, and extends to major shifts beyond country borders and regions. Consumption by the world's growing population also puts pressures on global resource systems and planetary boundaries. Global agreements such as the Paris Climate Change agreement (UNFCCC, 2015) and the Sustainable Development Goals (United Nations, 2015) play important roles in realigning national strategies towards identified global goals.

Encouraging technological innovation and investment through cutting-edge research across scales will also contribute to reducing some of the stresses on resource systems securities. An additional effective lever lies in the adoption of balanced trade strategies that help meet market needs without jeopardizing the sustainability of local resources or the resource security through increased dependability on other markets.

While many of these pressures are global and regional in scope, decisions and solutions are often offered at the national scale. When addressing WEF security challenges at a national scale, a

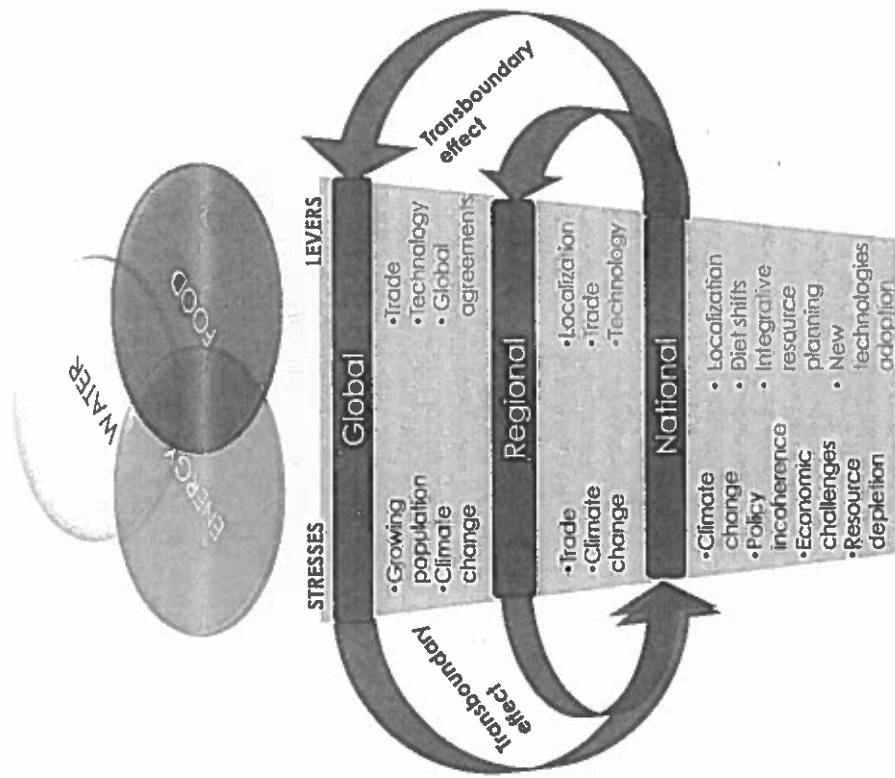


Figure 4.1 Multiscale stress and levers of WEF nexus and feedback loops across scales

main challenge lies in the lack of policy coherence across decision-making entities, and across scales. Lack of coordination and conflicting national goals could lead to unsound allocation practices with the potential to harm resource sustainability. Levers at the national scale could be driven by policy, through better integrative planning across sectors and scales, by industry, through improved efficiencies and management practices across supply chains, or by civil society, through altered habits of resource consumption.

An important aspect of the interaction of those securities across scales is the effect of one decision on another, particularly between scales. We saw examples of this effect during the 2008 food crisis, where national energy security policies related to increases in biofuel costs resulted in

Global security: the role of virtual water trade

Food trade is regarded as a significant lever for reducing global water stresses and managing regional water resources in water-poor regions. Trading in food commodities can be converted to virtual water, that water embedded in food products (Hoekstra, 2003). The virtual water concept was developed to assess water footprints and it is divided into green and blue water. Green water indicates available water in soil supplied by rainfall, and blue water indicates irrigation water supplied by technological facilities. Virtual water trade allows sharing water resources internally within and between countries or regions. Approximately 13% of the water used for worldwide crop production was traded internationally between 1995–1999 (Hoekstra and Hung, 2005), and 16% of the global water resources were used in production and export (Chapagain and Hoekstra, 2008). However, virtual water trade not only generates water savings for importing countries, but also causes water “losses” for the exporting countries (Chapagain et al., 2006). The water exported through commodities into the global market contributes significantly to changes in regional water systems of major exporters (Chapagain and Hoekstra, 2008). On the other hand, pushing to increase food self-sufficiency in traditionally food-importing countries may lead to depletion of local resources and competition with other sectors. Thus, understanding the impacts of food trade on water and food security can become a major driver towards more sustainable resource management.

Asian countries are major food suppliers, thus food trade within and outside of Asia can be an important factor for integrated water management in certain regions of Asia. Lee et al. (2016c) analyzed the contribution of virtual water from main exporters in Asia via crop trade between 2000 and 2012. Based on virtual water trade, approximately 46.9% and 40.9% of the total green and blue water exports in Asia were discharged from Asia to non-Asian countries. In the European Union (EU), the rate of virtual water export to non-EU countries was 30.2% (green water) and 25.2% (blue water). Importing food can be also viewed as allowing local resource saving in water, land, and energy. For example, Korea is a representative country, importing food and feed crops, with a volume of 96.2 Gm³ of virtual water imported via 41 crops traded between 2006 and 2010 (Lee et al., 2016b). A significant increase in domestic food production would be required for food security. However, significant water and energy requirement increases would happen as a result.

Changes in global trade can be the overriding variable for managing global water and food sustainably. Lee et al. (2016a) constructed a trade network of main food crops (primarily wheat, barley, and rice), and analyzed the characteristics of global virtual water trade, such as vulnerable and influential traders, using degree and eigenvector centrality. For example, the vulnerable importers are identified by large amount of virtual water import with low connectivity to exporters which could be a low-resilience structure. Mexico, Iran, the Philippines, and Japan were identified as vulnerable importers. The US, Russian Federation, Thailand, and Canada were identified as influential traders in global virtual water trade of green water, while western Asia, Pakistan, and India were identified as influential traders in global virtual water trade of blue water, an indicator of irrigation water supplied from an artificial facility.

Climate change also plays a major role in affecting availability of water supplies. It is necessary to tie in the climate change influences on the water–energy–food nexus boundary and further assess the holistic impacts of climate change in relation to food trade, food security in importers, and water security in exporters. Looking at global trade through a water–energy–food nexus lens can provide a basis for assessing holistic impacts of different international trade schemes on national and regional resource management.

The climate–security–resource nexus in northwestern Kenya

About 80% of Kenya's landmass is considered arid and semi-arid lands (ASALs). Northwestern Kenya is part of the country's drylands, and pastoralism and wildlife conservation are the dominant land-use systems in the region. The region is infamous for intermittent, long-standing inter-ethnic violent conflict, which dates back decades. Most human security studies in this region adopt a narrow focus concentrating either on the interplay between climate change and conflict, or resource scarcity and conflict (Adamo, Witsenburg, and Dietz, 2009; Campbell et al., 2009), but such narrow frameworks fail to capture the complex nature of the human security problem in the region. Moreover, past studies of the same phenomenon mostly relied on a narrow state-centric conceptualization of security.

But unlike the state-centric security analytical framework, a human security analytical framework compels us to pay more attention to security of people – as individuals and/or communities. Furthermore, it broadens the range of security threats from a single focus on violent conflict (including war) to include, among others, non-traditional threats such as food insecurity, water insecurity, disease and even the state in certain cases (Owen, 2004). By focusing on the complex interplay between climate variability, resources, and inter-ethnic violent conflict, this illustrative case analysis makes the case for a five-node climate–security–land–energy–water nexus as a better alternative for analyzing and understanding human security than the commonly known water–energy–food nexus, particularly in a northwestern Kenya context.

The region

Northwestern Kenya is comprised of seven arid and semi-arid counties: Samburu, Laikipia, Baringo, Isiolo, West Pokot, Turkana, and Marsabit (see Figure 4.2). The region forms the Kenyan portion of the Karimoja cluster – a transboundary, conflict-prone area that sits astride the borders of Kenya, Uganda, and South Sudan (Simons, 2011). The main economic activity for majority of the residents of the region is pastoralism – subsistence agriculture centered on the raising of various types of livestock. Other economic activities in the region include tourism (wildlife and cultural), small-scale trading, and cattle ranching among others.

For the most part, land in northwestern Kenya is owned communally under a system known as group ranch (Wayumba, 2004). Nomadic pastoralism practiced by the region's pastoral communities dictates that they move livestock frequently and relatively freely across the vast landscape (Asaka and Snucker, 2016). In that sense, a group ranch system of land ownership serves the pastoralists' interest better than a private property (in this case, land) ownership system would, because of mobility restrictions associated with the latter. In fact, private land ownership – an increasing reality in northwestern Kenya – elicits mixed reactions with some residents in favor and others against. The privatization trend in the region is informed in part by a strong privatization wave that began in the Maasai lands of southern Kenya, which has had significant implications (both positive and negative) for livelihood security and therefore human security of Maasai pastoralists (Wayumba, 2015).

Moreover, northwestern Kenya is experiencing considerable development activity, and therefore change. Discovery of oil and water reservoirs in Turkana, establishment of a large wind farm in Marsabit, construction of an international airport in Isiolo, and the building of the Kenyan section of the Nairobi–Addis Ababa highway are just a few of the ongoing development projects that may transform the region considerably. Also, community-based conservation continues to expand considerably in the region with implications for pastoralism both as a production system and as a source of livelihood for a majority of the region's residents.

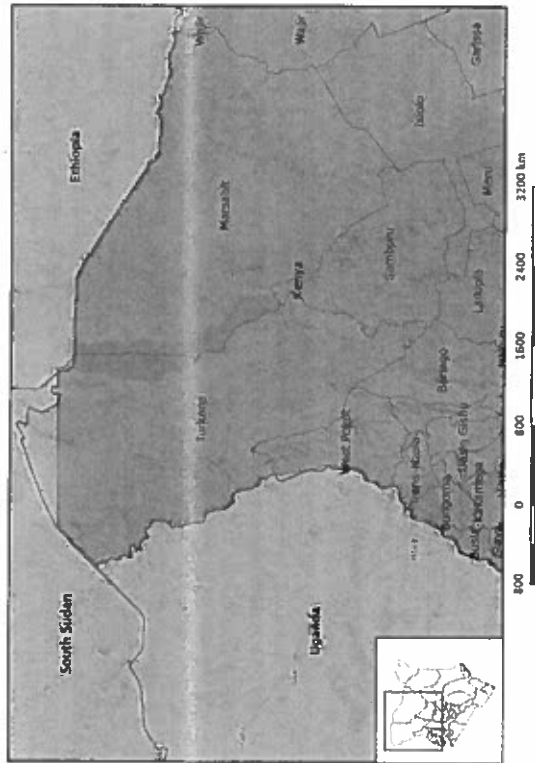


Figure 4.2 Map of northwestern Kenya
Source: Authors

Factors contributing to inter-ethnic violent conflict in northwestern Kenya

Inter-ethnic violent conflict is a dominant character of northwestern Kenya. A variety of factors contribute to inter-ethnic violent conflict in the region, including cattle rustling, proliferation of small arms, and competition over limited natural resources (mainly water and pasture) among others. For illustrative purposes the following discussion is focused on only the three mentioned contributing factors (for more in-depth discussion on violent conflict in the region see, for example, Njiru, 2012; Opiyo et al., 2012; Schilling et al., 2012; Mkutu, 2007; Mkutu, 2002).

Cattle rustling: One of the most common contributors of inter-ethnic violent conflict in the region is cattle rustling. Originally a small scale, rarely deadly traditional practice where a group from one ethnic group would invade another ethnic group and forcefully take away livestock primarily for restocking following a bad drought, cattle rustling today is a complex, large-scale, and deadly endeavor. In recent years, it has been commercialized (Schilling et al., 2012) and made worse by proliferation of small arms "from a variety of sources, including conflict areas in Sudan, Northern Uganda and elsewhere in the Horn of Africa, as well as from insecure official weapons stockpiles" (Mkutu, 2002 italics added).

Proliferation of small arms: Proliferation of illegal firearms complicates the security situation in northwestern Kenya. Due to inter-ethnic mistrust and the culture of cattle rustling, rival ethnic communities in the region have taken to stockpiling illegal firearms for their own protection

(Mkutu, 2007). Over time, weaponry gets more sophisticated and conflicts become more deadly (Schilling et al., 2012; Mkutu, 2007). The result is a state of perpetual intermittent inter-ethnic violent conflict, usually involving deaths. Disarmament attempts by the Kenyan State have been generally unsuccessful, in part because pastoral communities, having endured a long period of systemic marginalization imposed by consecutive government regimes (British colonial regime, the Kenyatta I regime, and Moi regime), are suspicious (or less trusting) of any government. In addition, porous borders in the Karamoja cluster make it easy to acquire guns from black market in the relatively lawless trans-border region.

Competition over scarce and limited resources: Perhaps the most significant contributor to inter-ethnic violent conflict in northwestern Kenya is competition for limited pasture and water particularly during dry periods. Since the majority of the region's population depend on pastoralism for their livelihood, availability of pasture and water for livestock is central to people's survival. It is therefore in the interest of each of the region's ethnic groups to secure grazing and watering rights for their livestock all year round. When water and pasture availability begins to dwindle, in-group cooperation and out-group competition becomes almost inevitable – given the lack of other options. Severe pasture and/or water scarcity can make competition degenerate quickly into conflict, usually along ethnic lines. In fact, research suggests that most conflict in the region emanates from the escalation of untamed inter-ethnic resource competition situations complicated by proliferation of small arms as well as simmering land and political issues among other factors (Njiru, 2012; Opiyo et al., 2012).

Regional and international dimensions

Resource-related inter-ethnic violent conflict in northwestern Kenya is not confined only to rival ethnic groups who inhabit this part of the country. Cross border inter-ethnic violent conflicts also do occur. In fact, a key defining character of the Karamoja cluster is cross border inter-ethnic violent conflict with strong links to cattle rustling. Importantly here, the term "border" is used loosely to denote either a regional or international boundary. In the context of this illustrative case, an inter-ethnic violent conflict is considered regional if it is between an ethnic group from northwestern Kenya and another ethnic group from a different region of the country, but international if it occurs between a Kenyan ethnic group and non-Kenyan ethnic groups from Uganda and/or South Sudan. Examples of inter-ethnic violent conflicts with an international dimension include long-standing conflicts between Toposa ethnic group of South Sudan and Turkana ethnic group of Kenya across the Nadapal–South Sudan border; Pokot ethnic group of Kenya and Matheniko (Karinjojong) ethnic group of Uganda across the Kenya–Uganda border; and Turkana ethnic group of Kenya and Matheniko (Karinjojong) ethnic group of Uganda.

Moreover, the emergence of "new" resources with both conflict and cooperation potential is likely to further complicate issues in the region. These new resources include recent discoveries of oil and underground water reservoir in Turkana County (Fong, 2015; Johannes et al., 2015), as well as the rise of clean energy alternatives, notably the Lake Turkana Wind Power project located in Loiyangalani, Marsabit County. Importantly, it remains unclear how the entry of these new resources will shape the human security landscape in northwestern Kenya and the Karamoja cluster, and across the greater Horn of Africa region. Energy and water are already emerging as frontiers for potential conflict, primarily at the sub-national level (e.g., the case of Turkana oil exploration project), and cooperation, primarily at the international level (e.g., the energy sharing pact between Kenya and Ethiopia) (Fong, 2015).

Making the case for a climate–security–resource nexus-based analytical framework

While all the seven counties that make up northwestern Kenya are categorized as arid and semi-arid lands (ASALs), they do not experience a uniform weather pattern. In fact, Samburu County, for example, typically experiences dry weather in one part (the low lands) and wet weather in another (the highlands) concurrently. In essence, climate variability has created an alternating pattern of resource abundance/scarcity – regarding both water and pasture – in northwestern Kenya. In the past, such climate variability was largely predictable and a nomadic lifestyle enabled northwestern Kenya's pastoral communities to cope with recurrent droughts, storms, and flash floods. Basically, during dry periods livestock would be moved from the low lands to the highlands and then back to the low lands during wet season. Galvin et al. (2001) point out that, "Climate variability by affecting ecosystem structure and function, has always influenced northwestern Kenya's livestock production and rainfed agriculture production" (p. 163 *italics added*).

But in the past few decades, climate variability has become increasingly unpredictable, thus making coping with drought, for example, more challenging for most of the region's pastoralists and agro-pastoralists. Irregular droughts, longer than normal droughts, irregular rainfall patterns, abrupt storms, and flash flooding are increasingly the norm in northwestern Kenya today. In part, the result is disruption of traditional livestock mobility patterns and increased competition for limited pasture and water, particularly during long droughts, often resulting in conflict. For instance, *The Guardian* recently reported that, "thousands of heavily-armed herders are invading conservancies, private properties and smallholdings in Laikipia, one of Kenya's most important wildlife areas, as they search for pasture for their cattle" (Cruise and van der Zee, 2017). Also, more rain in the highlands of northwestern Kenya (e.g. parts of Samburu County) has encouraged the spread of agriculture, which creates significant mobility challenges for pastoralists, raising the risks of conflict between them and their agro-pastoral counterparts.

Climate change seems likely to make these regional dynamics more complicated (Barnett and Adger, 2007). The "human security" chapter in the IPCC 5th Assessment Report described climate change as a human security threat multiplier, arguing that "human security will be progressively threatened as the Climate changes" (Adger et al., 2014). Considering the strong connection between inter-ethnic violent conflict and scarcity/accessibility of natural resources (mainly, water and pasture) in northwestern Kenya on one hand, and clear links between climate variability and the success or failure of the region's main source of livelihood (pastoralism) on the other hand, there is a real need to rethink the water–energy–food (WEF) nexus as a framework for understanding human security in the context of northwestern Kenya.

The three-node WEF nexus analytical framework offers useful insight(s) into the northwestern Kenya regional human security dynamics. For instance, through a WEF nexus framework it is possible to simultaneously consider the complex interplay between water, energy, and food in order to understand their role, or lack thereof, of in resource-related inter-ethnic violent conflicts in the region. However for the case of northwestern Kenya the WEF nexus framework leaves out two critical aspects that complete the inter-ethnic violent conflict puzzle in the region: climate and land. The complex nature of inter-ethnic violent conflict in the region requires nuanced understanding and a framework that accounts not only water, energy, and food dimensions, but also the climate and land dimensions. On this basis that a climate–security–resources nexus is a better alternative in the context of northwestern Kenya.

This five-node nexus framework consists of climate–security–land–energy–water (CSLEW). Thus, this case suggests flexible application and context-specific modification of the five-node nexus around which this volume is organized (see Chapter 1). With a CSLEW nexus framework

it is possible to improve understanding of the complex interplay between climate change, human security, and natural resources in the inter-ethnic violent conflict-prone region. Finally, this illustrative case makes two additional contributions to the dynamic and growing body of nexus research. First, it succeeds in showing that context matters in nexus research. Whereas a WEF nexus framework might be sufficient to understand human security in certain contexts, it is evidently not well suited to provide a nuanced understanding of the same in the context of northwestern Kenya. Second, it highlights the significance of attention to scale in nexus research.⁶ Particularly, the case describes how at one scale the emergence of new resources seems to enable cooperation while at another scale the same phenomena seem to generate conflict.

Conclusion

Climate change and resource nexus challenges and analysis are increasingly linked to traditional and human security concerns across scales. There is little doubt that accelerating climate change impacts and their social, political, and economic implications add stress at and across multiple scales, and therefore must be accounted for in nexus research, foresight analysis, and governance (see e.g. Bleischwitz, Johnson and Dozler, 2013). Resource gaps and governance challenges occur across scales, resulting in pressures that potentially perpetuate insecurities and increase the risks of violence and social unrest. Such threat multipliers may manifest in local communities or within a region of a single country, or spill over borders or involve whole societies. This is not a simple claim that resources or climate change cause conflict on their own. Rather, such factors may increase the risks of violence in particular contexts. Nexus research is not simply about modeling (Braudeau and Molnar, 2014) or "managing resources." It also intersects with long-standing social and political conflicts, some of which are – or could be – quite violent.

While resource security challenges are experienced in different scales, actions and implementation may also occur at and across scales. In an effort to improve levels of water, energy, and food securities, integrated and coherent policies and strategies may be needed at a national scale, including horizontal coherence across sectors and vertical coherence across more granular scales within the national context. Yet measures enacted by local actors and institutions – as well as international and global actors – will also be needed. Options for shifting dependence of nations' or communities' resource securities to increased imports or localization must be evaluated and the trade-offs for the relative choices in either direction should guide planning and policy action. In the case of food security, for example, such an assessment would span beyond the national borders to account for the resilience of exporting countries to climate change, their political stability, and overall vulnerability to global market fluctuations. Such analysis – and related policy actions – will likely need to grapple with the host of resources (water, energy, etc.) embedded in food production and the food and agricultural trade. Such interlinkages are likely to reveal that risks across countries and world regions are considerably more interconnected than they appear at first glance. The same is likely true for many climate change impacts. In the northwestern Kenyan case, some combination of local and community engagement with national and international actors may well be necessary, if violent conflicts are to be reduced in the future rather than multiplied. Policymakers may be able to leverage existing global and regional agreements to improve the alignment of global targets and resource securities. There is a role for policy, industry, and civil society to play in alleviating those pressures and reducing the risks of instability and insecurity across the different scales, while being aware to the feedback and transboundary effects. Finally, various resource nexus approaches to both analysis and decision-making in practice will increasingly have to grapple with climate change and security interactions. Too often, policymakers, activists, experts, and combatants are likely overlook the

important resource and climate-related drivers of social and political conflict. Nexus approaches seek to reveal and anticipate such connections – and inform actions intended to reduce conflict risks and costs.

Notes

- 1 See the SDGs Goal 6 webpage: <https://sustainabledevelopment.un.org/sdgs>
- 2 For more on the nexus and the SDGs, see Ivanova and Escobar-Pemberton, this volume.
- 3 This section draws from the ongoing work of Rabi H. Molliar, Bassel Dahser, and Sanghyun Lee.
- 4 For more on scale and the nexus, see Johnson and VanDeveer, this volume.
- 5 Jeremiah O. Asaka's doctoral research examines transformations in conservation governance and implications for human security in northwestern Kenya, where he conducted fieldwork in 2013 and 2016.
- 6 On scale and the resource nexus, see also Johnson and VanDeveer, this volume.

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ROUTLEDGE HANDBOOK OF THE RESOURCE NEXUS

*Edited by Raimund Bleischwitz,
Holger Hoff, Catalina Spataru, Ester van der
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"The language of the nexus highlights the need for interconnected thinking between the natural and social sciences, and between the research community and decision makers. By bringing together such an outstanding range of thinkers and perspectives from across the world, *Routledge Handbook of the Resource Nexus* looks set to become an indispensable volume for all those engaged in these debates. It sets out with admirable clarity the theoretical, empirical and research underpinnings of this field, and will provide nexus brokers and boundary-spanners with the intellectual tools they need to achieve tangible progress."

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