

LAND DEGRADATION AS A SECURITY THREAT AMPLIFIER: THE NEW GLOBAL FRONTLINE

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1.1.1 INTRODUCTION

Land degradation is generally understood to be the reduction or loss of biological or economic productivity (UNCCD, 1994: Article 2) resulting in decreased yields, incomes, food security, and the loss of vital ecosystem services. These impacts, in turn, serve to undermine the peace and stability of land-dependent communities. Thus, there appears to be a demonstrable link between land degradation and human security, especially when we consider how poverty and hunger lead to migration and conflict.

The health and resilience of our land resources (e.g., soil, water, and biodiversity) are largely determined by our management practices, governance systems, and environmental changes. The conversion of natural ecosystems or the unsustainable use of fertilizers, pesticides, and irrigation for food production contributes not only to land degradation at the local level, but also to increased carbon emissions, reduced biodiversity, and diminished rainfall on regional and global scales (Sivakumar, 2007). Indeed, land degradation, biodiversity loss, and climate change are considered to be intertwined threats to human security that contribute to a downward spiral in the productivity and availability of land resources (D'Odorico et al., 2013; Mueller et al., 2014).

Demonstrating sufficient causation or the existence of feedback loops between land degradation, climate change, and human security has proved difficult due to a host of other contributing factors, such as political and economic instability and social fragmentation, which are often considered more proximate determinants (Thiesen et al., 2013; Koubi et al., 2014; Selby and Hofmann, 2014). While the political and economic influences on human security are often more visible and are often cited as causes, land degradation and climate change are recently being more clearly identified in empirical studies from multiple places in the world, most prominently in Africa and Asia (Paul and Roskaft, 2013; Taylor, 2013; Bond, 2014; van Schaik and Dinnissen, 2014).

In these cases, a strong association between land degradation, climate change, and human security is found when one critically examines the host of underlying drivers that contribute to poverty, hunger, migration, and conflict. Without adaptation strategies and resilience building devoted to responsibly managing and restoring our natural capital, land degradation, especially in developing countries, will

continue to be a significant factor threatening rural livelihoods, triggering forced migration, and aggravating conflicts over limited natural resources (Barnett and Adger, 2007). In extreme cases of land degradation, desertification, and drought, entire communities are forced to migrate from their ancestral lands to areas where competition for scarce resources already exists and thus contributing to a higher risk of conflict (Kumssa and Jones, 2014).

Given the global scope of land degradation, considering both its causes and impacts, there is an environmental and a socio-economic imperative to address it as an underlying threat to peace and security, from the scale of local communities to that of entire continents. This chapter will briefly explore these linkages and potential responses through the lens of human security, setting the stage for the remainder of this book. The aim is to convince decision makers of the urgent need to halt and reverse land degradation trends, while at the same time highlighting practical and cost-effective solutions, including the adoption and scaling-up of sustainable land management (SLM) practices and ecosystem restoration activities.

1.1.2 THE HUMAN SECURITY LENS

The perceived causes of insecurity have increased and diversified considerably over the last few decades. While political and military issues remain key, perceptions of conflict and security have broadened to include economic and social threats, such as poverty, infectious diseases, and environmental degradation as significant contributing factors (Kingham, 2011). This new understanding of the diverse challenges to human security is now reflected in national and international policy debates.

National security has long been seen as the ability of a country to militarily defend itself against threats and aggression both foreign and domestic. In the 1970s, the notion of “environmental security” was introduced to broaden the national security perspective by focusing on the long-term sustainability of our climate system, the natural resource base, and its capacity to provide for future generations (Falk, 1972; Brown, 1977). In 1982, the Independent Commission on Security and Disarmament Issues advanced the concept of “common security,” pushing national security assessments and strategies to adopt a more interdisciplinary approach while also recognizing the transboundary nature of environmental security (ICDSI, 1982).

The 1994 United Nations Human Development Report (UN HDR) makes it clear that national and environmental security can no longer be considered in isolation; it coined the term “human security” to encompass the less often considered threats to human well-being—namely, those related to food, economic, health, and environmental security (UNDP, 1994). In essence, human security is seen as the universal right of individuals and communities to enjoy peace (not fear) and stability (not want) in the pursuit of sustainable development; in broad strokes, it embodies freedom from conflict, access to resources, and the opportunity to improve the human condition (Biswas, 2011; Westing, 2013).

The human security perspective is provoking novel ways of thinking in defense ministries around the world, including the recent attention by the North Atlantic Treaty Organization (NATO) to “hybrid threats,” which are seen as more than just the amalgamation of existing security challenges (NATO, 2009). While still evolving, the human security lens embraces complexity—namely, the interdependencies among constituent elements, a multiplicity of stakeholders with vested interests, and a dynamic security landscape where traditional military solutions may not be a key component (Aaronson et al., 2010). It also recognizes the importance of transnational cooperation and governance for the sustainable use of the stocks and flows of land resources that transcend political boundaries.

With respect to land resources, human security provides a multifaceted perspective conducive to the observation of the causal factors linking the trinity of land degradation, biodiversity loss, and climate change to increased human insecurity. In terms of its practical application, the lens must be fixed on addressing the conditions and processes that reduce the options available to deal with potential insecurities of any kind (Zografos et al., 2014). Most notably, the 1994 UN HDR emphasizes the role of early prevention and the cost effectiveness of reducing the underlying threats that increase the vulnerability of communities and ecosystems: the basic premise of this book.

1.1.3 LAND DEGRADATION CAN MAKE THINGS WORSE

The combined challenge of an increasing population (i.e., more demand for land-based resources) and the impacts of climate change (particularly drought) on food and water security will no doubt continue to jeopardize human security. Land degradation, even when not a direct cause, is a significant contributing factor or “threat amplifier” that acts in combination with other factors in a highly specific geographical location and socio-economic context (van Schaik and Dinnissen, 2014). A number of qualitative case studies indicate that environmental stress may, under specific circumstances, increase or amplify the risk of violent conflict, but not necessarily in a systematic or unconditional way (Bernauer et al., 2012).

As already stated, the term *land degradation* refers to a loss in productivity and availability of land resources, such as soil, water, and biodiversity, while recognizing that the condition of these resources are inextricably linked in nonlinear processes and are difficult to segregate (Sterzel et al., 2014). Globally, approximately 25% of all land is highly degraded, while 45% is considered stable or slightly/moderately degraded; remarkably, only 10% of all land is considered to be improving (FAO, 2011). Over 2 billion people worldwide depend on 500 million small-scale farmers for their food security; this accounts for 80% of the food consumed in Asia and sub-Saharan Africa (IFAD, 2013). In India, it is estimated that 296 million acres (approximately 70%) of the 417 million acres of land under cultivation are degraded, with over 200 million people dependent on this degraded land for their sustenance (ICAR, 2010).

In addition to lower yields and incomes, land degradation reduces water productivity and affects its availability, quality, and storage (Bossio et al., 2010). This often leads to a reduction in other important regulating services, such as soil stability and fertility, climate control, and carbon sequestration. Around 1.2 billion people (i.e., almost one-fifth of the world’s population) live in areas experiencing water scarcity, and another 500 million people are fast approaching this situation (UNDP, 2006). Increased water scarcity is evident throughout much of the world as groundwater tables recede, rivers and lakes run dry, and rainfall lessens and becomes more erratic. In much of Africa and Asia, this means less arable land for farmers and the loss of grazing lands and freshwater sources for pastoralists. In northern Nigeria, a significant relationship exists between freshwater scarcity and conflicts among farmers and pastoralists: the availability and management of water sources were found to be the most potent predictors of conflict between sedentary farmers and nomadic herders (Audu, 2013).

As with climate change, biodiversity loss is both a cause and consequence of land degradation, contributing to its impact on many key elements of human security. In the last hundred years, forest cover in Haiti has been reduced from 60% to 2%. This has significantly increased the country’s vulnerability to both rapid-onset disasters, such as landslides and flooding, and to slow-onset environmental

degradation, such as drought, soil erosion, and the loss of productive land (Williams, 2011). Without economic support and effective governance mechanisms for the sustainable management of land resources, the Haitian rural economy will continue to suffer, while the incentives for migration as an adaptation strategy increase. The influx of migrants to urban areas, coupled with extreme poverty and a lack of political institutions, has led to an alarming rise in armed gangs and crime over the past decade (Alscher, 2011).

Land degradation directly affects the health, stability, and livelihoods of approximately 1.5 billion people. It is particularly acute in the world's drylands (i.e., arid, semi-arid, and dry sub-humid areas), which account for land on which one-third of the global population lives, up to 44% of all the world's cultivated systems, and about 50% of the world's livestock breeding and feeding grounds (MA, 2005). Climate change and drought, shifts in vegetation composition, accelerated soil erosion, and other functional disturbances caused by human activities have made these working landscapes susceptible to rapid land degradation, with observed feedbacks on regional climate patterns and desertification (Ravi et al., 2010). The increased levels of stress in dryland ecosystems, combined with weak economies and poor governance systems, often render them unable to withstand the pressures of population growth.

1.1.4 GLOBAL THREATS TO HUMAN SECURITY

Scarcity and uneven distribution generate additional pressures on natural resources, which put at risk the health and well-being of affected communities, often with wider implications for regional and global security. An increasing number of fragile states are unable to cope with the human consequences of environmental degradation or to provide much-needed assistance to communities experiencing land resource scarcities. While the causes of conflict in Darfur are many and complex, regional climate variability, water scarcity, and the steady loss of fertile land were found to be important underlying factors (UNEP, 2007). This can be measured in terms of economic assistance, Fatou Bensouda, chief prosecutor of the International Criminal Court, told the UN Security Council that the 10-year conflict has cost the UN and humanitarian aid organizations more than US\$10.5 billion (UN, 2013).

While acknowledging that conflicts can rarely be characterized as purely resource-driven, competition over natural resources can intensify and exacerbate existing tensions, amplifying risks for intra- and interstate conflict, rural to urban and international migration, and potentially contributing to crime or extremism. Land degradation is more often the consequence of conflicts in many regions in Africa, the Middle East, and Asia that are particularly prone to relapse, in part as a result of continued poor governance and the failure to address land and water management issues in the post-conflict period (Brinkman and Hendrix, 2011; Weinthal et al., 2014).

In recent decades, international migration flows have been characterized by people moving from Asia and Africa to North America and Europe. This is expected to continue; for the period 2010–2050, the number of migrants heading to the developed countries is likely to reach 96 million (DESA, 2013). Once again, the dryland regions are a particular focal point: they account for about 40% of the Earth's total land surface, are home to more than 2 billion people (Safriel et al., 2005), and are expanding, with one study suggesting that an estimated 135 million people will be at risk of being displaced by desertification over the coming decades due to water shortages and reduced agricultural output (GHF, 2009). In sub-Saharan Africa alone, another assessment indicates that some 60 million people are expected to move from desertified or degraded areas to northern Africa and Europe by 2020, with this figure likely to increase until 2045 (UK MOD, 2014).

As mentioned, land degradation is one of many factors that cause internal displacement, rural to urban and international migration. For instance, legal uncertainty, especially regarding land tenure, can be an important social driver for multiple migrations. This is the case in some parts of Benin, where clear legal status would help to promote sustainable land management and avoid a perpetuation of environmental degradation (Doevenspeck, 2011). The lack of rural employment opportunities is another major factor contributing to these migration trends. The UK Ministry of Defense predicts that rural areas with larger youth populations, lack of employment opportunities, and poor governance are likely to suffer from instability, which could lead to unrest or conflict; at the same time, growing urban unrest could pose major security challenges, with the potential for countrywide repercussions (UK MOD, 2014).

The impacts of land degradation not only pose serious challenges to sustainable development, but they also amplify the underlying social, economic, and political weaknesses that exist at the local and national levels. Food shortages can lead to sharp price increases and result in instability in those areas unable to cope; according to the World Bank, rising food prices have caused 51 food riots in 37 countries since 2007 (World Bank, 2014). For countries in which social safety nets or alternative sources of income are lacking, victims become refugees; in some cases, internally displaced people and forced migrants turn to crime and extremism for survival and a sense of purpose.

1.1.5 SUSTAINABLE LAND MANAGEMENT AND RESTORATION

Practical and cost-effective solutions are at hand. Recent studies show the great potential for the large-scale restoration and rehabilitation of land resources in many parts of the world. For example, it is estimated that there are over 2 billion hectares that are suitable and available for forest landscape restoration (GPFLR, 2014). This analysis spurred the Bonn Challenge to mobilize financial pledges to restore 150 million hectares of degraded and deforested land by 2020, with nearly a dozen countries now participating (IUCN, 2014). The Bonn Challenge is not a new global commitment, but rather a vehicle for realizing existing international objectives, including the Convention on Biological Diversity (CBD)'s Aichi Biodiversity Targets; the UN Framework Convention on Climate Change (UNFCCC)'s REDD+ mechanism, which goes above and beyond the Reducing Emissions from Deforestation and Forest Degradation (REDD) principles; and the 2012 UN Conference on Sustainable Development (Rio+20) goal of land degradation neutrality.

Another global study estimated that there are up to 500 million hectares of abandoned land (crop and pasture) with the potential for recovering agricultural productivity and other services through appropriate land management and restoration (Campbell et al., 2008). This represents an important but neglected opportunity, as there are many proven and cost-effective conservation and restoration practices that could benefit both people and ecosystem functioning (Stavi and Lal, 2015). A concerted global effort is clearly needed to halt and reverse land degradation, restore degraded ecosystems, and sustainably manage land resources. The priority now is to tackle the immediate challenge of how to sustainably intensify the production of food, fuel, and fiber to meet future demand without further degrading our finite land resources (Aronson and Alexander, 2013).

SLM practices, such as agroforestry and conservation agriculture, can boost yields, improve food security, and prevent future land degradation (Branca et al., 2013). SLM practices include the integrated management of crops (trees), livestock, soil, water, nutrients, biodiversity, disease, and pests in order to optimize a range of ecosystem services (Liniger et al., 2011). As water is a limiting factor

in most rain-fed regions, SLM practices can be tailored to improve water management and availability, particularly for small farmers, while also improving nature's functions and the livelihoods of the rural poor (Bossio et al., 2010). In terms of human security, the overall objective of SLM is to maximize provisioning services (e.g., food, water, and energy), while enhancing the resilience of land resources and the communities that depend on them.

The term *ecosystem* or *ecological restoration* refers to the process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed (SER, 2004), typically as a result of human activities. The science and practice of restoration have made significant advances in the past two decades, increasing our understanding and ability to better manage ecosystems and their connectivity in the wider landscape. Many restoration efforts have the objective of improving the delivery of ecosystem services of high value in supporting human livelihoods, including carbon storage, climate and water regulation, the provision of clean water, and the maintenance of soil fertility (Holl and Aide, 2011; Rey Benayes et al., 2009; Lamb, 2011). With traditional practices, such as farmer-managed natural regeneration (agroforestry), water harvesting, and the creation of windbreaks, farmers in Niger and throughout the Sahel have experienced significant income gains due to higher production values, with little expenditure other than that of additional labor (Haglund et al., 2011).

At the UN Conference on Environment and Development in Rio de Janeiro in 1992, the global community recognized that healthy and productive ecosystems are necessary for sustainable and equitable development. This conference gave birth to Agenda 21 and the Rio Conventions—namely, the CBD, the UNFCCC, and the UN Convention to Combat Desertification (UNCCD). These resulting forms of international governance set out to address the causes and impacts of land degradation, biodiversity loss, and climate change by addressing these global environmental challenges and concerns as key security issues (UNDP, 1994). Member states reiterated these commitments and common goals with even greater urgency 20 years later at Rio+20.

1.1.6 LAND DEGRADATION NEUTRALITY

At Rio+20, world leaders agreed on the urgent need to reverse land degradation and recognized that good land management provides significant social and economic benefits. The Rio+20 outcomes document, *The Future We Want*, set out a new level of ambition: “to strive to achieve a land-degradation neutral world” (UNGA, 2012). This heralds a new commitment to a world where all nations individually strive to achieve land degradation neutrality by (i) managing land more sustainably, which would reduce the rate of degradation; and (ii) increasing the rate of restoration of degraded land, so that the two trends converge to give a zero net rate of land degradation (Grainger, 2015).

Land degradation neutrality is a hybrid lay-scientific concept that is now being developed in parallel processes, so that scientific analysis leads to findings that will better inform decision makers (Grainger, 2010; UNCCD, 2013b). In many countries, achieving land degradation neutrality will require a paradigm shift in land stewardship: from “degrade-abandon-migrate” to “protect-sustain-restore” (UNCCD, 2013a). This means cooperation among sectors, including those concerned with human security, and national sustainable development plans that embrace complementary land management options: (i) adopting and scaling up sustainable land management policies and practices in order to minimize current, and avoid future, land degradation; and (ii) rehabilitating degraded and

abandoned production lands, as well as restoring degraded natural and semi-natural ecosystems that provide vital (albeit indirect) benefits to people and working landscapes.

In the case of Brazil, a country rich in terrestrial carbon and biodiversity, agricultural production is forecast to increase significantly over the next 40 years. A recent study produced the first estimate of the carrying capacity of Brazil's 115 million hectares of cultivated pasturelands, where researchers investigated if the more sustainable use of these existing production lands could meet the expected increase in demand for meat, crops, wood, and biofuels. They found that current productivity is at 32%–34% of its potential and that sustainable intensification to 49%–52% would provide an adequate supply of these goods until at least 2040, without further land or ecosystem degradation and with significant carbon sequestration benefits (Strassburg et al., 2014).

While some of the scientific knowledge and many of the organizing principles needed currently exist to support land degradation neutrality as an important element in the Sustainable Development Goals and the post-2015 development agenda, significant challenges remain, which are addressed in this book, including:

- Scaling up locally relevant tools and technologies
- Overcoming social constraints and reforming economic incentives
- Creating enduring institutions and equitable governance systems
- Improving methods and indicators for monitoring, evaluation, and communication

Moving forward, there is an immediate need to identify existing projects suitable for testing the ambition of land degradation neutrality, as well as establishing new projects at the local, community, or landscape scale to further its effectiveness in implementation and monitoring.

1.1.7 CONCLUSIONS

Land degradation is a widespread crisis, destabilizing nations and communities on a global scale. To be clear, food will be less plentiful (and thus more expensive) unless responsible land management and restoration is given priority on the international political agenda. The commitment to halt and reverse land degradation will undoubtedly feature prominently in post-2015 development and climate agendas. If this helps to bring about a transformative shift in land management policies and practices, it will certainly contribute to achieving the global priorities of ensuring human security by eradicating poverty and hunger and by reducing migration and conflict. While safeguarding human security poses numerous challenges, to which we need to react, there are many proactive solutions—early interventions on the ground—that offer cost-effective opportunities for reducing risk and vulnerability at various scales.

The human security perspective allows us to focus on shared solutions to multiple challenges and to better assess the social, economic, and environmental dimensions of sustainable development in order to leverage integrated and mutually reinforcing approaches that are context specific. In this book, the authors and editors have provided valuable insights into a number of issues related to protecting and restoring our land resources for the benefit of current and future generations. Using case studies from around the world, they have outlined the diverse strategies and multiple benefits of a holistic land-based approach to reducing some of the underlying drivers of human insecurity. They conclude that investing in these practical nature-based solutions, which transform lives and reduce vulnerability, would be cheaper and more effective in many cases than investing in walls, wars, and relief.

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