**Shoring up peace: Water and post-conflict peacebuilding**

Jessica Troell [a] and Erika Weinthal [b]

[a] *Environmental Law Institute*
[b] *Duke University*

Online publication date: October 2014

# Shoring up peace: Water and post-conflict peacebuilding

*Jessica Troell and Erika Weinthal*

Water is essential to human health, poverty alleviation, sustainable livelihoods, and food security. Yet 780 million people worldwide still lack access to safe drinking water, and 2.5 billion live without access to basic sanitation (UNICEF and WHO 2012). Of the approximately 2 million people who die each year from waterborne and water-washed illnesses, the majority are children under five (Water Aid 2011). In 2012, addressing the United Nations General Assembly on the culture of peace, UN Secretary-General Ban Ki-moon observed that "[p]eople intuitively understand that there can be no military solution to conflicts . . . that the world's scarce resources should be spent to help people flourish, not to fund weapons that cause more suffering. . . . $1.7 trillion dollars was spent last year on weapons. That is an enormous cost to people who go to bed hungry . . . children who die because they lack clean water . . ." (UN 2012).

For countries emerging from conflict, access to water and sanitation plays an integral role in meeting basic human needs, maintaining public health, and supporting livelihoods at the household and community levels. As these countries embark on the arduous pathway to peace, the provision of safe water is among the highest priorities for government and humanitarian efforts.

Freshwater is unequally distributed, spatially and temporally, both within and across states, resulting in seasonal and geographic scarcity (see figure 1, which depicts renewable water resources per capita in countries affected by major conflict between 1990 and 2013). Global water use nearly tripled during the second half of the twentieth century, far outstripping population growth during that period and placing increasing stress on water resources (CRS 2009). The Food and Agriculture Organization of the United Nations estimates that by 2025, approximately 1.8 billion people will be living in areas with absolute water

Jessica Troell is a senior attorney and director of the International Water Program at the Environmental Law Institute. Erika Weinthal is an associate professor of environmental policy at the Nicholas School of the Environment, Duke University.
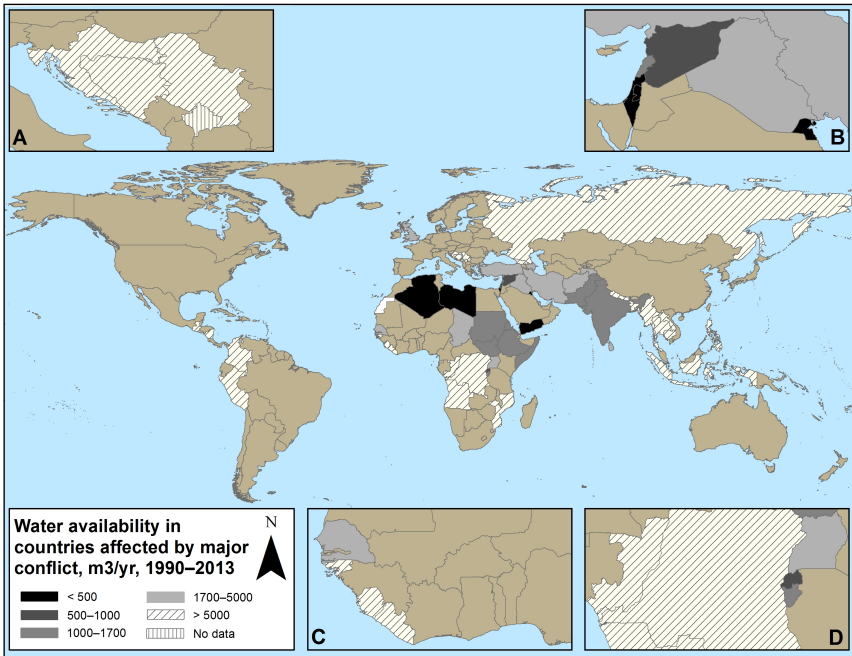
**Figure 1.   Water availability in countries affected by major conflict, cubic meters per year, 1990–2013**

*Source*: FAO (2013).

*Notes*: A = Southeastern Europe; B = West Asia; C = West Africa; and D = Central Africa.

*Major conflict* is a conflict resulting in more than 1,000 battle deaths (Bruch et al. 2014; UCDP n.d.).

scarcity, and approximately two-thirds of the world's population will be experiencing some form of water stress (UNDESA n.d.; UN Water and FAO 2007).[1]

But the global water crisis is not simply a matter of physical scarcity: it is also a crisis of governance. Institutional and management failures, lack of financial and technological capacity and investment, and corruption are often to blame for inequities in access to water (TI 2008). The challenges associated with governing water wisely are particularly problematic in post-conflict countries, where governance and institutional frameworks are often weak or nonexistent, and the technical, financial, and infrastructural capacity to provide water and sanitation services is lacking.

Of the fifty-five countries affected by major conflict during or since 1990, fifty-one share at least one basin with one or more other nations; of the remaining four, two are island states (see table 1). During conflict, countries are often unable to (or fail to) engage in international dialogue regarding the allocation and development of shared waters. And during post-conflict recovery, the imperative to develop

---

[1] *Absolute water scarcity* is defined as annual water availability below 500 cubic meters per person; *water stress* is defined as annual water availability below 1,700 cubic meters per person.

**Table 1.   Countries and territories affected by major conflict since 1990, with and without transboundary basins**

| *With transboundary basins* | | *Without transboundary basins* |
| --- | --- | --- |
| Afghanistan | Liberia | Kuwait |
| Algeria | Libya | Philippines |
| Angola | Mozambique | Sri Lanka |
| Azerbaijan | Myanmar | Yemen |
| Bangladesh | Nepal | |
| Bosnia and Herzegovina | Nicaragua | |
| Burundi | Pakistan | |
| Cambodia | Palestine† | |
| Chad | Peru | |
| Colombia | Republic of Congo | |
| Croatia | Russia | |
| Democratic Republic of the Congo | Rwanda | |
| El Salvador | Senegal | |
| Eritrea | Serbia | |
| Ethiopia | Sierra Leone | |
| Georgia | Somalia | |
| Guatemala | South Sudan† | |
| Guinea-Bissau | Sudan | |
| India | Syria | |
| Indonesia | Tajikistan | |
| Iran | Thailand | |
| Iraq | Timor-Leste† | |
| Israel | Turkey | |
| Kosovo | Uganda | |
| Laos | United Kingdom | |
| Lebanon | | |

*Sources*: Bruch et al. (2014); Institute for Water and Watersheds (n.d.).
*Note*: *Major conflict* is a conflict resulting in more than 1,000 battle deaths (Bruch et al. 2014; UCDP n.d.).
† Denotes countries whose transboundary waters are not recorded in Institute for Water and Watersheds (n.d.).

water resources as a means of supporting livelihoods and economic development goals can strain relations among countries that share basins. For example, in response to drought in the Helmand River Basin, Afghanistan has made unilateral decisions that reduced the flow of the river to Iran, increasing tensions between the two states (Dehgan, Palmer-Moloney, and Mirzaee 2014*).[2] This situation also exemplifies the interplay among the post-conflict imperative to develop, other pressures on water resources (such as climate variability and change), and regional politics.
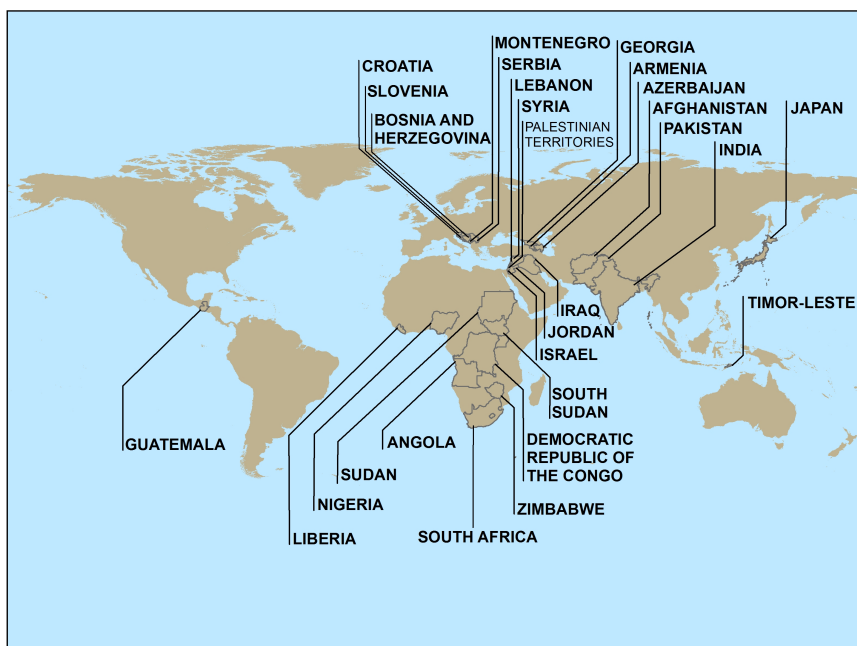
Of the many high-level political commitments made over the past decades to provide water and sanitation services to the world's poorest people, the most prominent are the UN Millennium Development Goals (MDGs), established in 2000, which include global targets for expanding access to safe drinking water and sanitation (UN 2009). The critical role of water in ensuring human health and well-being was reinforced in 2010, when the UN recognized access to clean water and sanitation as a fundamental human right, ratcheting up pressure to meet and surpass the MDGs and increasing emphasis on the social and political dimensions of access to safe water (UNGA 2010).

Progress toward meeting the MDGs has been mixed. One water-related goal was to halve the proportion of people lacking access to safe drinking water by 2015. As of 2010, more than 2 billion people had gained access to improved water sources—five years ahead of the target date (UNICEF and WHO 2012). However, many of the countries with the lowest levels of access still lag. Of the thirty-four countries farthest from reaching the MDGs, twenty-two are experiencing or emerging from conflict (ECOSOC 2010). As of 2010, no conflict-affected country had met a single MDG, although by 2013 Afghanistan, Myanmar, and Nepal reported meeting the target on improved access to water (World Bank 2011, 2013).

The populations of conflict-affected countries are twice as likely to lack clean water as those in other developing countries (World Bank 2011). In sub-Saharan Africa in the early 2000s, the percentage of the population with improved access to water was 15 percent higher in countries that had not experienced conflict than in those that had (Schwartz, Hahn, and Bannon 2004). Since the MDGs were put in place, only a few post-conflict countries have made significant improvements in access to water. Between 1990 and 2010, for example, Ethiopia increased the percentage of the population with access to improved water from 13 to 66 percent (World Bank 2011).

Water resources play a critical role in post-conflict recovery and peacebuilding: restoring livelihoods, supporting economic recovery, and facilitating reconciliation. The goal of this book is to examine how and under which conditions water can be effectively harnessed to contribute to peacebuilding in post-conflict situations. The nineteen chapters that follow explore diverse water-related interventions from twenty-eight conflict-affected countries and territories in Africa, Asia, Europe, and the Middle East (see map on page 5). The book draws on experiences in these and other locations to create a framework for understanding how decisions and activities related to water resources can facilitate, undermine, or otherwise influence

---

[2]   Citations marked with an asterisk refer to chapters within this book.

MONTENEGRO | GEORGIA
SERBIA
CROATIA | ARMENIA
LEBANON
SLOVENIA | AZERBAIJAN
SYRIA
AFGHANISTAN | JAPAN
BOSNIA AND | PALESTINIAN | PAKISTAN
HERZEGOVINA | TERRITORIES
INDIA

IRAQ
JORDAN
ISRAEL

TIMOR-LESTE

SOUTH
SUDAN

GUATEMALA

ANGOLA | DEMOCRATIC
REPUBLIC OF
THE CONGO

SUDAN

NIGERIA | ZIMBABWE

LIBERIA | SOUTH AFRICA

**Post-conflict and conflict-affected countries and territories from which lessons have been drawn in this book, either through case studies or broader thematic analyses**
*Notes*: UN member states are set in bold. During the time under consideration in this book, the Palestinian territories were known as the occupied Palestinian territories.

peacebuilding processes. (For an overview of key terms and concepts related to natural resources and post-conflict peacebuilding, see sidebar.)

The rebuilding of conflict-affected societies entails a large number of actors, including post-conflict governments at the national and local levels, humanitarian and aid organizations, civil society organizations, armed forces (including both civilian and military personnel), and the citizens of the country. The thirty-five authors who have contributed to this book have had wide-ranging experiences—from negotiating treaties to overseeing humanitarian and development interventions in rural communities—and offer diverse perspectives on post-conflict water management.

This book provides a series of snapshots of specific contexts at particular moments. Because post-conflict situations often evolve rapidly, later developments may influence the lessons drawn from the experiences detailed in these chapters. Nevertheless, it is valuable to document these efforts in order to create a more systematic framework for understanding the ways in which water management can be more effectively integrated into peacebuilding.

The remainder of this chapter is divided into five parts: (1) a discussion of the direct and indirect impacts of conflict on water resources, highlighting connections between hydrogeological, social, economic, and political factors and their influences on the post-conflict context; (2) an examination of the role of water

**Post-conflict peacebuilding and natural resources: Key terms and concepts**

Following conflict, peacebuilding actors leverage a country's available assets (including natural resources) to transition from conflict to peace and sustainable development. Peacebuilding actors work at the international, national, and subnational levels and include national and subnational government bodies; United Nations agencies and other international organizations; international and domestic nongovernmental organizations; the private sector; and the media. Each group of peacebuilding actors deploys its own tools, and there are a growing number of tools to integrate the peacebuilding efforts of different types of actors.

A post-conflict period typically begins after a peace agreement or military victory. Because a post-conflict period is often characterized by intermittent violence and instability, it can be difficult to pinpoint when the post-conflict period ends. For the purposes of this book, the post-conflict period may be said to end when political, security, and economic discourse and actions no longer revolve around armed conflict or the impacts of conflict, but focus instead on standard development objectives. Within the post-conflict period, the first two years are referred to as the *immediate aftermath of conflict* (UNSG 2009), which is followed by a period known as *peace consolidation*.

According to the United Nations, "Peacebuilding involves a range of measures targeted to reduce the risk of lapsing or relapsing into conflict by strengthening national capacities at all levels for conflict management, and to lay the foundations for sustainable peace and development" (UNSG's Policy Committee 2007). In many instances, this means addressing the root causes of the conflict.

There are many challenges to peacebuilding: insecurity, ethnic and political polarization (as well as marginalization), corruption, lack of governmental legitimacy, extensive displacement, and loss of property. To address these and other challenges, peacebuilding actors undertake diverse activities that advance four broad peacebuilding objectives:*

- *Establishing security*, which encompasses basic safety and civilian protection; security sector reform; disarmament, demobilization, and reintegration; and demining.
- *Delivering basic services*, including water, sanitation, waste management, and energy, as well as health care and primary education.
- *Restoring the economy and livelihoods*, which includes repairing and constructing infrastructure and public works.
- *Rebuilding governance and inclusive political processes*, which encompasses dialogue and reconciliation processes, rule of law, dispute resolution, core government functions, transitional justice, and electoral processes.

Although they are sometimes regarded as distinct from peacebuilding, both peacemaking (the negotiation and conclusion of peace agreements) and humanitarian assistance are relevant to peacebuilding, as they can profoundly influence the options for post-conflict programming. Peacemaking and humanitarian assistance are also relevant to this book, in that they often have substantial natural resource dimensions.

Successful peacebuilding is a transformative process in which a fragile country and the international community seek to address grievances and proactively lay the foundation for a lasting peace. As part of this process, peacebuilding actors seek to manage the country's assets—as well as whatever international assistance may be available—to ensure security, provide basic services, rebuild the economy and livelihoods, and restore governance. The assets of a post-conflict country include natural resources; infrastructure; and human, social, and financial capital. Natural resources comprise land, water, and other renewable resources, as well as extractive resources such as oil, gas, and minerals. The rest of the book explores the many ways in which natural resources affect peacebuilding.

---

\* This framework draws substantially from the *Report of the Secretary-General on Peacebuilding in the Immediate Aftermath of Conflict* (UNSG 2009), but the activities have been regrouped and supplemented by activities articulated in USIP and U.S. Army PKSOI (2009), Sphere Project (2004, 2011), UN (2011), UNSG (2010, 2012), and International Dialogue on Peacebuilding and Statebuilding (2011).

at war's end in meeting basic human needs, and of the sociopolitical challenges that accompany this task; (3) a consideration of the multiple pathways through which investments in water management can help to rebuild livelihoods and revitalize economies, especially by helping to restore the agricultural sector; (4) an exploration of water management in post-conflict peacebuilding, highlighting the role of governance mechanisms and international water law in fostering effective cooperation and reconciliation at both the national and transboundary levels; and (5) a brief description of the organization of the remaining chapters in the book.

## IMPACTS OF CONFLICT ON WATER RESOURCES

Historically, water resources and infrastructure have been strategic targets during conflict, and opposing sides have targeted water infrastructure and water to disrupt troop movements and compromise livelihoods. In fact, the deliberate destruction of water services and infrastructure has led to some of the most damaging direct and collateral impacts of modern warfare (Haavisto 2003). During World War II, for example, Allied bombing inflicted severe damage on Germany's water supply and treatment facilities (Jones et al. 2006). Decades later, in order to cripple local economies, the Soviet army deliberately destroyed one-third of all the traditional irrigation systems (*karez*) in Afghanistan (Formoli 1995). Attacks on water resources and infrastructure were also widespread during Liberia's first civil war (1989–1996): in 1990, Charles Taylor's rebel forces seized control of the Mount Coffee Water Plant, the country's only hydroelectric facility, thereby cutting off all water and electricity flowing to the capital, Monrovia (UNEP 2004; IRIN 2006). Over the course of the war, the plant was completely destroyed, forcing Monrovia's residents to rely on individual wells, which drew groundwater that was often contaminated (UNEP 2004).

In post-conflict situations, the destruction of water infrastructure and the contamination of water supplies present pressing challenges for meeting basic human needs and protecting public health. During Liberia's protracted civil wars, many of the country's community-based water and sanitation facilities were damaged: in 1989, before the first civil war began, 45 percent of urban populations and 23 percent of rural populations had access to pipe-borne water; by 1999, only 25 percent of urban residents and 4.1 percent of rural residents had such access. At the end of the second civil war (1999–2003), pipe-borne water was essentially unavailable, leaving the population dependent on ponds, rivers, and untreated wells as their primary source of drinking water (ROL and UNDP 2006). Since the end of the last war, Liberia has struggled to provide its citizens with access to safe water and sanitation. As of 2009, the government reported that 75 percent of its population had sustainable access to improved water sources and that 44 percent of its population had access to improved sanitation. However, 63 percent of those with improved access to sanitation were urban residents, and only 27 percent of those with improved access were rural residents (ROL and UNDP 2010).

Even where water resources are not directly targeted during conflict, water infrastructure often suffers from neglect. For example, years of international war and civil strife severely damaged Iraq's water and sanitation networks: by 2008, less than half of Iraq's population had access to potable water, and less than 10 percent of urban households outside of Baghdad were connected to sewage systems (Dhayi 2008).

Perhaps most distressing is the socioeconomic harm that results from the lingering and indirect impacts of war: when the institutions that oversee the management and provision of water services are weak or nonexistent, the population is vulnerable to increased risks of disease, food insecurity, and death. Thus, even as the fighting stops, mortality rates may continue to rise, as unsanitary living conditions and the lack of safe drinking water lead to outbreaks of diarrheal and other waterborne and water-washed illnesses (Ghobarah, Huth, and Russett 2003). High mortality rates from water contamination and lack of sanitation have been documented in a number of post-conflict countries, including the Democratic Republic of the Congo (DRC), Liberia, and Sierra Leone (IRC 2008; Ghobarah, Huth, and Russett 2003). In the DRC, the International Rescue Committee estimates that 2.1 million of the 5.4 million deaths that occurred between 1998 and 2007 took place after the war had formally ended in 2002 (IRC 2008).

During wartime, basic maintenance of water supply systems in urban areas is often neglected. In addition, rural populations in search of safety and employment often flee to cities during and immediately after war, placing tremendous additional stress on already weakened water and sanitation systems (Jacobsen 2010). In Afghanistan, for example, violence, drought, and food shortages have driven many rural citizens to urban areas (Sharp et al. 2002): since 2001, Kabul's population has tripled in size (to approximately 4.5 million), and 80 percent of this increase has come from migrants and returning refugees (Setchell and Luther 2009). Such rapid growth often takes the form of informal urban or peri-urban settlements, in which basic services are minimal or nonexistent. Residents who have no direct access to piped water must buy water from private vendors, often at much higher prices than they would pay for water from public utilities. In some areas of the country, the monthly cost of domestic water supplies (twenty-five liters per person per day) for a family of eight is equivalent to approximately one-quarter of a government employee's monthly salary (CPHD 2011).

Another concern is potential conflict between displaced populations and local communities over water resources. In eastern Chad, where arable land is scarce and groundwater hard to access, local communities are finding it increasingly difficult to coexist peacefully with the 250,000 Sudanese refugees who have fled conflict in Darfur (IRIN 2009a). While international standards require that refugees receive between ten and fifteen liters per person per day of freshwater, many camps in eastern Chad cannot even supply ten.

As noted earlier, in addition to destroying physical infrastructure, armed conflict takes a critical toll on the institutional capacity of the water sector—the governance frameworks that make effective water management possible. Many

post-conflict countries lose human capital when qualified staff flee or are killed during conflict; moreover, new staff often lack training and technical capacity, further impeding recovery and reconstruction. In Afghanistan, for example, by 2001, nearly all of the 400 staff of the Central Authority for Water Supply and Sewerage had fled or been killed, and all of the authority's equipment and vehicles had been destroyed (Pinera and Reed 2014*).

## MEETING BASIC HUMAN NEEDS THROUGH HUMANITARIAN INTERVENTIONS

The shattered landscape described in the previous section is the remnant upon which war-torn societies must rebuild the water services and infrastructure that will provide the basis for domestic life, public health, and livelihoods, as well as for sustainable economic development and poverty alleviation. When peace arrives, efforts to provide basic services are among the highest priorities of governments, citizens, humanitarian organizations, and donors. Almost invariably, however, mechanisms for ensuring that post-conflict interventions in the water sector are coordinated and sustainable are lacking. Moreover, the destruction of both formal and informal institutions for water management during conflict poses particular challenges for post-conflict water sector interventions. In Afghanistan, for example, violent disputes over water increased even after post-conflict recovery efforts began—because, as one Oxfam representative explained, "[t]hirty years of war has left sources of water co-opted, stolen and contaminated" (Vidal 2010). A 2008 Oxfam survey in Afghanistan found that, after land, water was the second-most-contentious issue at the local level, owing to its domestic and agricultural importance (Waldman 2008). Understanding how damage to both the physical and institutional aspects of water services has affected relationships among users is critical when attempting to rebuild institutions for water management.[3]

Once conflict has ended, one of the first tasks is to locate clean water sources for refugees, internally displaced persons (IDPs), and residents of communities whose water supplies were affected by the conflict or have yet to be connected to improved water sources. However, when humanitarian organizations attempt to accommodate populations that have migrated away from war-torn or water-scarce areas to places where water is available, limited water supplies are subject to additional stress, which may lead to competition over these resources. Water scarcity can also constrain efforts to resettle or facilitate the return of refugee populations. In Afghanistan, for example, the Office of the United Nations High Commissioner for Refugees is making a concentrated effort to assist IDPs and returning refugees by increasing access to safe drinking water, especially in the drought-affected northern part of the country (UNHCR 2009).

---

[3] See, for example, McCarthy and Mustafa (2014*).

Immediate interventions are likely to take the form of temporary, short-term efforts to protect human health. Such efforts must be undertaken with care, however: installing camps in water-scarce regions without assessing water availability or monitoring use and impacts can result in overuse of the resource, as was the case in Darfur, where the aquifer was overdrawn and the water table fell (Tearfund 2007).

In most post-conflict settings, the government lacks the necessary financial and technical capacity to effectively deliver water and sanitation services, so the international community provides assistance.[4] Increasingly, such efforts include interventions that involve a wide variety of actors, including humanitarian organizations, bilateral development agencies, nongovernmental organizations (NGOs), international financial institutions, military personnel, agencies of foreign governments, and the formal and informal private sector. Such efforts raise a number of questions, however, during the various phases of post-conflict water-related interventions. For example, to what extent are nonstate actors able to establish viable and effective water and sanitation systems in post-conflict countries? And might the provision of public services by nonstate actors create problems of access, affordability, or quality? These are among the questions addressed in this book.

Water services and infrastructure are generally regarded as essential public goods that the state must provide for its population. The state's ability to do so (or to create enabling conditions for others to do so) is a key peace dividend and an indicator of progress in building peace after conflict. To maintain security and achieve credibility in the peacebuilding process, new governments often make promises designed to meet heightened expectations, including improved access to land, medical services, and education, as well as water and sanitation. Liberian president Ellen Johnson Sirleaf, for example, made numerous high-profile commitments to improving access to water and sanitation that were in line with the MDGs. Nevertheless, by 2006 (three years after Liberia's second civil war had ended), the "percentage of people with access to basic social services such as clean and safe drinking water . . . averaged about 40 percent of their pre-war levels" (ROL and UNDP 2006, 40). Moreover, in 2012, NGOs working in the water sector stated that they had yet to develop even 5 percent of the improved sources promised in Liberia's Poverty Reduction Strategy (Boley 2012). Thus, even with high-level political commitment, the rebuilding of water and sanitation infrastructure and delivery systems can take many years, especially where state institutions have been devastated by war and resources must be allocated among many competing redevelopment goals.

Continued violence and high insecurity further complicate the delivery of water and sanitation services in post-conflict situations. As a result, humanitarian and aid organizations often cede a certain amount of their role in recovery and

---

[4]   See, for example, Welle (2008).

reconstruction to members of the military, who may be ill-equipped to undertake such activities. In Iraq, for example, after the 2003 bombing of the UN headquarters in Baghdad, UN agencies that had been involved in the early repair and rehabilitation of the water and sanitation sectors were forced to pull out. In addition to its original mandate to secure peace and help rebuild governance capacity, the Coalition Provisional Authority was then tasked with overseeing reconstruction efforts, including basic service provision and economic development (Jones et al. 2006). Ongoing violence, however, has rendered water infrastructure repair in urban areas an insurmountable challenge: during a few years in the mid-2000s, over 600 workers from the Ministry of Municipalities and Public Works were killed attempting to repair water and sanitation networks (Dhayi 2008). Similar difficulties in Afghanistan have led military units to integrate humanitarian interventions into counterinsurgency operations by establishing provincial reconstruction teams, which consist of civil affairs staff, members of the U.S. National Guard, and Afghan civilians (Palmer-Moloney 2014*; Civic 2014).

Despite the need for large influxes of capital to restore infrastructure, security risks have led the private sector to shy away from investing in the water sector in post-conflict countries (Schwartz, Hahn, and Bannon 2004). Often, in both urban and rural post-conflict environments, local communities (frequently with the support of NGOs) and the informal private sector have stepped in to fill the gap in water services (Pinera and Reed 2014*; Burt and Keiru 2014*). While such efforts meet a critical need, reliance on unregulated community-based institutions and the informal sector can lead to inequitable tariffs and uneven water quality and service. In Angola, for example, much of the water provided by the informal sector is neither treated nor tested for compliance with domestic water quality standards (Cain 2014*). In the DRC, however, in the absence of government delivery of safe drinking water, community-based groups built and managed small, piped-water networks (UNEP 2011). In this case, the assistance of an international NGO was instrumental in ensuring the necessary institutional and technical capacity to build and sustain the systems. Such efforts, often undertaken with limited resources, target specific underserved communities or locations. Whether such an approach might be scaled up to restore basic water and sanitation services to a large number of communities, or at the national level, and the extent to which such efforts can be integrated into national-level planning and policy making are questions for further research.

Finally, both interventions to improve water and sanitation, and peacebuilding activities more broadly, can significantly impact scarce water resources. A UN peacekeeper, for example, requires eighty-four liters of water per day; it is therefore essential for peacebuilding actors to take into account the possibility that they are competing with surrounding communities for water resources (Waleij et al. 2014; UNEP 2012). Recognizing the potential competition, peacekeepers have started to implement measures to conserve water. For example, to meet water requirements for UN peacekeeping operations in Sudan, Bengali troops are harvesting rainwater (Waleij et al. 2014).

## REBUILDING LIVELIHOODS AND REVITALIZING ECONOMIES

As post-conflict countries transition from short-term humanitarian assistance toward longer-term recovery and development, the sustainability of water supply, sanitation, irrigation, and other water sector interventions depends on strengthening state capacity to manage initiatives and build them into national policies and programs. Although the international community often tries to distinguish humanitarian efforts from development efforts, both are actually part of a development continuum that begins after war's end. Thus, even when decisions over water allocation and use are designed as humanitarian interventions, policy makers must recognize that such decisions will have implications for medium- and long-term development. For example, in addition to meeting basic needs, provision of immediate access to water creates a foundation for rebuilding livelihoods and the economy. Determining how water will be allocated and used for household consumption, agriculture, and industry is also key to development. The restoration of agricultural economies, for example, depends not only on access to fertile land but also on access to water resources.

Decisions about water allocation and use must also take environmental sustainability into account. In the case of humanitarian interventions, there is rarely time to assess the potential medium- to long-term impacts on water resources; nevertheless, those impacts may ultimately constrain options for livelihoods and sustainable development. Rapid impact assessment is one tool for overcoming such obstacles, as is better coordination among UN agencies undertaking post-conflict assessments (Conca and Wallace 2012; Kelly 2012). Moreover, interventions designed to rebuild livelihoods will need to reinforce social and environmental resilience—particularly with respect to climate variability. Such a comprehensive approach will help ensure post-conflict countries can cope with uncertainty and with increasingly frequent shocks to and stresses on water systems, including floods and droughts (Matthew and Hammill 2012).

Because interventions to support reconstruction and recovery occur in both urban and rural environments, various levels of government must coordinate in order to ensure policy coherence. Coordination is further complicated by the cross-sectoral nature of water; thus, decisions about water allocation and use must balance competing demands for water across sectors. Finally, it is important to ensure that short-term interventions lay the groundwork for (or at least do not create obstacles to) water governance frameworks that will provide an enabling environment for both sound resource management and sustaining the peace. For instance, ensuring food security at war's end is critical for facilitating the return and resettlement of refugees, IDPs, and demobilized soldiers. Such initiatives often entail infrastructural and institutional support for farmers' efforts to rekindle an agricultural sector devasted by conflict. But to succeed, land distribution and irrigation programs must take water rights and availability into account. Post-World War II Japan and post-partition India and Pakistan, for example, enhanced food security, rebuilt the agricultural sector, and fostered economic growth by

focusing early recovery efforts on the construction of irrigation and drainage systems in tandem with broader land and agricultural reforms (Sugiura, Toguchi, and Funiciello 2014*; Zawahri 2014*).

Choosing among various paths for post-conflict economic development invariably entails trade-offs. Because energy supply is often one of the greatest constraints to rebuilding post-conflict economies, construction or rehabilitation of large hydroelectric dams have been a common donor-supported initiative to foster economic development. Dams can also diversify energy resources: pumped-storage hydroelectric dams can store the potential energy from a mix of renewable sources.[5] Moreover, by storing excess water when it is plentiful and releasing water in times of scarcity, dams can also help regulate flows and facilitate flood and drought management.

A number of states faced with rapidly growing populations—including Afghanistan—continue to promote dam construction as a means of providing stable water supplies and electricity in the short term and bringing their populations out of poverty in the long term (Dehgan, Palmer-Moloney, and Mirzaee 2014*). It should be noted, however, that the construction of large-scale dams has also been associated with adverse social and environmental impacts, leading to local and regional conflict (Conca 2005). Dam construction and water storage require large tracts of (often arable) land; as a result, people living near the dams must be resettled. Dams also affect aquatic ecosystems, in many cases damaging the resource base on which local livelihoods depend. As countries emerge from conflict, decisions as to whether dams should be used to foster economic growth must take into account both domestic politics and the broader regional context. In some instances, such as in the Great Lakes region of Africa, hydroelectric production has provided a platform for regional cooperation (Westerkamp, Feil, and Thompson 2009).

Decision makers must also weigh the costs and benefits of various water tariff structures and the role of privatization in water management and service delivery. In the 1980s and 1990s, faced with rampant urban growth compounded by declining water quality and diminishing water supplies, many countries experimented with privatizing water services. By the end of the 1990s, more than fifty cities in twenty-seven developing countries had either privatized their water systems (through concessions or contracts with companies that paid the up-front costs of improving water supply and sanitation systems, in return for the profits from the operation) or leased them to nongovernmental entities for operation and maintenance (Noll, Shirley, and Cowan 2000).[6]

---

[5] Pumped-storage hydroelectric dams store energy from renewable sources for use when generating capacity might be low (for example, at night for solar power, or on calm days for wind power). When demand for electricity is low, a pumped-storage dam pumps water into a higher reservoir; when demand increases, water is released into a lower reservoir to generate power.

[6] See also McKenzie and Mookherjee (2005).

Where state-owned water utilities have failed to maintain and retrofit infrastructure, various forms of public-private partnerships have also been seen as a viable solution (del Castillo 2008). If foreign investors are to recover the initial costs of connecting new users to the network, however, they often need to raise water tariffs—but because there are no alternatives to water, critics have noted that the negative impacts of such price increases fall disproportionately on the poor (Shiva 2002). Such price increases may further disenfranchise local populations in post-conflict countries, because even a minimal increase may make it prohibitively expensive for the very poor to reap welfare gains during the recovery period.

Another critical challenge is the dearth of hydrological data, including basic information on water quality and availability, which heightens uncertainty for interventions designed to restore livelihoods and the economy. Some gaps in data can be traced to the destruction caused by conflict; in many cases, however, baseline data never existed. In Afghanistan, for example, no hydrometeorological data has been collected for Helmand Basin—one of country's largest watersheds—since the late 1970s, before the Soviet invasion (Palmer-Moloney 2014*).

## WATER, CONFLICT, AND PEACEBUILDING

Since the early 1990s, a great deal of literature in the field of international water management has focused on the relationship between conflict and water scarcity (both natural and human induced).[7] A number of highly publicized statements from world leaders further fueled the notion that water scarcity is an enduring source of conflict. Most notably, Boutros Boutros Ghali, an Egyptian politician and diplomat who later became UN Secretary-General, warned in 1985 that "the next war in the Middle East will be fought over water, not politics" (Vesilind 1993, 53).

As international water management has matured over the past few decades, more nuanced studies have examined the ways in which water can lead to conflict, as well as the ways in which it can facilitate peace (Conca and Dabelko 2002). Indeed, at the interstate level, scholars have found that cooperative behavior is more likely than conflict: of the 1,800 interactions that occurred in transboundary basins between 1946 and 1999, none led to formal war (Wolf, Yoffe, and Giordano 2003; Wolf et al. 2005). Even in the Middle East, most of the international tension over water has stayed at the level of heated rhetoric.

Researchers have found that the greatest likelihood for interstate conflict over water occurs during periods of institutional change (Wolf, Yoffe, and Giordano 2003). Since the 1990s, the collapse of the Soviet empire and the breakup of various states led to the formation of a number of new states in the Balkans, East-Central Europe, the former Soviet Union, and Africa. New political borders can wreak havoc on water-sharing arrangements—and can, at times, create new

---

[7]  See, for example, Gleick (1993).

transboundary basins, as was the case with the Aral Sea Basin, in Central Asia, and the Sava Basin, in the former Yugoslavia (Weinthal 2002; Čolakhodžić et al. 2014*). In other cases, the breakup of states can change the number of riparians in an international river basin, as was the case in the Nile Basin after South Sudan's 2011 referendum vote for independence (Salman 2014*).

The securitization of water as a source of conflict, however, continues to pervade the field of international water management, particularly when it comes to arid regions in Africa and the Middle East. Studies of hydro-hegemony have emphasized that the structural and bargaining power of the riparians, which depends largely on whether a country is located upstream and on the extent of its economic and military resources, can determine whether water is more likely to lead to cooperation or conflict (Zeitoun and Warner 2006).

Although issues of conflict and scarcity have overshadowed the potential role of water management in peacebuilding, some studies (Conca and Dabelko 2002), as well as the chapters in this book, focus on the role of institutions and international water law in helping to foster cooperation and reconciliation. Some researchers have also begun to examine the role of transboundary treaties and water basin institutions as mechanisms that may help resolve conflict by building trust and confidence through joint management and technical coopera-tion (Conca, Wu, and Mei 2006). Others have looked at the relationship between international water management and state building to understand the ways in which international actors can help foster peaceful relations, regarding water, during transitional periods (Weinthal 2002). Still others have looked at the role of local institutions and approaches in negotiation and conflict resolution (Wolf 2000).

The specter of climate change, and its potential impact on the availability and distribution of freshwater resources, has compounded the fear that so-called water wars are inevitable. Through a large-scale study of rainfall variability and political conflict in Africa, Cullen Hendrix and Idean Salehyan found a robust relationship between social unrest and extreme deviations in rainfall (Hendrix and Salehyan 2012). Thomas Bernauer and Tobias Siegfried have argued that climate-change-induced shifts in river runoff will likely exacerbate interstate tensions over water in Central Asia, particularly between Kyrgyzstan and Uzbekistan (Bernauer and Siegfried 2012). Other observers, however, caution that accounts seeking to link climate change to conflict should avoid hyperbole, and should instead focus on the channels through which climate change is likely to interact with other variables, such as governance, in exacerbating both climate- and non-climate-related vulnerabilities and thus acting as a potential conflict multiplier (Raleigh and Urdal 2007; Matthew et al. 2010; UN 2009; Mayoral 2012; Dabelko 2009).

There is no question that in some parts of the world, water scarcity has indeed led to local conflicts. In northeastern Kenya, for example, recurrent droughts have forced the Turkana people—a pastoralist population in East Africa—to travel farther and more frequently to find water and pasture for their livestock.

Often, other pastoralist groups interpret such movement as aggression. Meanwhile, in the absence of state protection, pastoralist communities have obtained small arms, and violent localized conflicts have led to dozens of deaths (IRIN 2009b, 2009c).[8]

Climate variability can also have cross-border effects. For example, protracted drought throughout the Horn of Africa and decades of internal conflict in Somalia have overwhelmed efforts to deal with widespread famine, forcing large-scale migrations of Somalis into Kenya and Ethiopia (Afifi et al. 2012).

Nevertheless, the effects of climate change on water availability do not necessarily lead to conflict. Because water is a shared resource, scholars have argued that a collective desire for survival renders cooperation over shared water basins viable (Meinzen-Dick and Nkonya 2005). In northern Kenya, for example, a sense of mutual dependence may account for the strength of some local institutions —which, instead of engaging in the widespread conflicts over resources in that area, have cooperated to cope with issues of water scarcity and drought (Adano et al. 2012). Furthermore, some international institutions and treaties may be better able to accommodate water variability in international river basins, and thereby mitigate conflict (De Stefano et al. 2012). However, most water treaties lack the flexibility necessary to cope with the uncertainty engendered by climate variability and change (Carius 2009).

## ORGANIZATION OF THE BOOK

This book explores options for improving post-conflict peacebuilding by integrating water into the peacebuilding process. Part 1 focuses on the challenge of providing clean water and sanitation in post-conflict settings in order to alleviate humanitarian crises. The chapters in this part explore the ways in which access to water and sanitation services can provide peace dividends by addressing the immediate and basic needs of the population. Given that armed conflict disrupts traditional social norms and coping mechanisms, forcing communities to migrate and to compete for water access even when seeking refuge, part 1 examines an array of interventions to resolve conflict over access to water and sanitation in the face of weakened state capacity. Finally, the chapters address the critical role of informal water suppliers, especially in urban and peri-urban centers where state institutional capacity is lacking.

The chapters in part 2 examine the ways in which water can be harnessed to help restore livelihoods, foster sustainable development, reduce poverty, and attain food security. Taken together, the analyses show that success depends on the quality of the water data and on the extent to which (1) affected populations are involved in the design and maintenance of water systems and (2) decisions

---

[8]   For an analysis of livestock management, conflict, and peacebuilding in the Karimojong Cluster, see Lind (2014).

take account of the broader institutional context. In particular, the chapters emphasize that coordination between the water and agricultural sectors is necessary to reinvigorate the agricultural sector, which in post-conflict countries is the sector that most supports livelihood restoration.

Part 3 explores the ways in which water management can foster cooperation, build confidence, and increase trust among former adversaries. The chapters show that where water is a source of tension, it is essential to include discussions of the water sector in the formal peace process and to institutionalize this cooperation through formal governance mechanisms, such as joint water commissions (at the international level) or domestic mechanisms to address multilevel and intersectoral water governance.

The chapters in part 3 also highlight the importance of civil society engagement in international waters—specifically, the ways in which face-to-face meetings between citizens can further strengthen trust and confidence across borders. Another theme that runs through part 3 is the importance of incentives, typically provided by third parties, to encourage states that share water basins to build cooperative water governance institutions, as a first step in the larger process of regional reconciliation. (Here, too, the chapters show that a dearth of reliable water data can impede cooperation.) Finally, chapters examining countries that have undergone partition consider water management in relation to changing political borders, within the broader context of state building and regional water management.

Building on part 3, which considers how the design of treaties can be used to support regional cooperation, part 4 examines the domestic legal frameworks that undergird water management. Although there is no single path for effective water management, whatever legal framework is chosen will set the initial institutional context for how water is allocated and used. For example, including a right to water and sanitation in a constitution can both address past discrimination in access to water and facilitate reconciliation and trust building.

While the parts focus on basic services, economic development, cooperation, and legal institutions, the chapters also highlight the many feedback mechanisms and connections between these domains. Cooperation, for example, is essential not only for building trust but also for ensuring that allocation of water among sectors can be accomplished equitably and effectively. Water governance and institutional frameworks—also central to all chapters—allow for sound resource management and can foster reconciliation in post-conflict situations.

## CONCLUSION

The chapters that follow demonstrate that restoring water services and infrastructure is critical to the transition from conflict to peace, and must be integrated into programs designed to reestablish security, governance, reconciliation, and economic reconstruction. Taken as a whole, the book demonstrates the urgency of finding more integrated and effective mechanisms for addressing water

resources as part of the broader peacebuilding process—that is, as a means of ensuring that basic human needs are met, that economic development progresses, and that peace is sustained.

## REFERENCES

Adano, W. R., T. Dietz, K. Witsenburg, and F. Zaal. 2012. Climate change, violent conflict and local institutions in Kenya's drylands. *Journal of Peace Research* 49 (1): 65–80.

Afifi, T., R. Govil, P. Sakdapolrak, and K. Warner. 2012. Climate change, vulnerability and human mobility: Perspectives of refugees from the East and Horn of Africa. Report No. 1. Bonn, Germany: Institute for Environment and Human Security, United Nations University. www.ehs.unu.edu/file/get/9951.pdf.

Bernauer, T., and T. Siegfried. 2012. Climate change and international water conflict in Central Asia. *Journal of Peace Research* 49 (1): 227–239.

Boley, T. 2012. In Liberia, political battles center on water access. PBS Newshour, April 25. www.pbs.org/newshour/rundown/2012/04/in-liberia-political-battles-center-on-water-access.html.

Bruch, C., D. Jensen, M. Nakayama, and J. Unruh. 2014. *Post-conflict peacebuilding and natural resources: The promise and the peril*. New York: Cambridge University Press.

Burt, M., and B. J. Keiru. 2014. Community water management: Experiences from the Democratic Republic of the Congo, Afghanistan, and Liberia. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Cain, A. 2014. Conflict and collaboration for water resources in Angola's post-war cities. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Carius, A. 2009. Climate change and security in Africa: Challenges and international policy context. Paper commissioned by the United Nations Office of the Special Adviser on Africa for the expert group meeting "Natural Resources, Climate Change and Conflict in Africa: Protecting Africa's Natural Resource Base in Support of Durable Peace and Sustainable Development," New York, December 17–18.

Civic, M. A. 2014. Civil-military coordination and cooperation in peacebuilding and natural resource management: An enabling framework, challenges, and incremental progress. In *Governance, natural resources, and post-conflict peacebuilding*, ed. C. Bruch, C. Muffett, and S. S. Nichols. London: Earthscan.

Čolakhodžić, A., M. Filipović, J. Kovandžić, and S. Stec. 2014. The Sava River: Transitioning to peace in the former Yugoslavia. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Conca, K. 2005. *Governing water: Contentious transnational politics and global institution building*. Cambridge, MA: MIT Press.

Conca, K., and G. D. Dabelko, eds. 2002. *Environmental peacemaking*. Washington, D.C.: Woodrow Wilson Center Press; Baltimore, MD: Johns Hopkins University Press.

Conca, K., and J. Wallace. 2012. Environment and peacebuilding in war-torn societies: Lessons from the UN Environment Programme's experience with post-conflict assessment. In *Assessing and restoring natural resources in post-conflict peacebuilding*, ed. D. Jensen and S. Lonergan. London: Earthscan.

Conca, K., F. Wu, and C. Mei. 2006. Global regime formation or complex institution building? The principled content of international river agreements. *International Studies Quarterly* 50 (2): 263–285.

CPHD (Center for Policy and Human Development). 2011. *Afghanistan human development report 2011. The forgotten front: Water security and the crisis in sanitation.* Kabul, Afghanistan: Kabul University. www.cphd.af/nhdr/nhdr2010/Complete%20 NHDR%202011%20final.pdf.

CRS (Catholic Relief Services). 2009. *Water and conflict: Incorporating peacebuilding into water development.* Baltimore, MD. www.crsprogramquality.org/storage/pubs/ peacebuilding/waterconflict.pdf.

Dabelko, G. D. 2009. Avoid hyperbole, oversimplification when climate and security meet. *Bulletin of the Atomic Scientists*, August 24. http://thebulletin.org/avoid-hyperbole -oversimplification-when-climate-and-security-meet.

Dehgan, A., L. J. Palmer-Moloney, and M. Mirzaee. 2014. Water security and scarcity: Potential destabilization in western Afghanistan and Iranian Sistan and Baluchestan due to transboundary water conflicts. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

del Castillo, G. 2008. *Rebuilding war-torn states: The challenge of post-conflict economic reconstruction.* New York: Oxford University Press.

De Stefano, L., J. Duncan, S. Dinar, K. Stahl, K. M. Strzepek, and A. T. Wolf. 2012. Climate change and the institutional resilience of international river basins. *Journal of Peace Research* 49 (1): 193–209.

Dhayi, B. 2008. Iraq's water and sanitation crisis adds to dangers faced by children and families. Unicef.com, March 19. www.unicef.org/infobycountry/iraq_43232.html.

ECOSOC (Economic and Social Council, United Nations). 2010. Joint special event of the Economic and Social Council (ECOSOC) and the peacebuilding commission (PBC) on "MDGs in countries emerging from conflict." Issues note. New York, July 19. http://esango.un.org/event/documents/ISSUES%20NOTE%20-%20FINAL.doc.

FAO (Food and Agriculture Organization of the United Nations). 2013. AQUASTAT database. www.fao.org/nr/water/aquastat/data/query/index.html?lang=en.

Formoli, T. A. 1995. Impacts of the Afghan-Soviet war on Afghanistan's environment. *Environmental Conservation* 22 (1): 66–69.

Ghobarah, H. A., P. Huth, and B. Russett. 2003. Civil wars kill and maim people—Long after the shooting stops. *American Political Science Review* 97 (2): 189–202.

Gleick, P. H. 1993. Water and conflict: Fresh water resources and international security. *International Security* 18 (1): 79–112.

Haavisto, P. 2003. Conflict and the environment: Lessons learned. *Environment House News* 8:1–3.

Hendrix, C., and I. Salehyan. 2012. Climate change, rainfall, and social conflict in Africa. *Journal of Peace Research* 49 (1): 35–50.

Institute for Water and Watersheds. n.d. International river basins of the world. Table 4: International river basin register. Oregon State University. www.transboundarywaters .orst.edu/publications/register/tables/IRB_table_4.html.

International Dialogue on Peacebuilding and Statebuilding. 2011. A new deal for engagement in fragile states. www.oecd.org/dataoecd/35/50/49151944.pdf.

IRC (International Rescue Committee). 2008. Mortality in the Democratic Republic of Congo: An ongoing crisis. IRC and Burnet Institute. www.rescue.org/sites/default/files/ migrated/resources/2007/2006-7_congomortalitysurvey.pdf.

IRIN (Integrated Regional Information Networks). 2006. *Running dry: The humanitarian impact of the global water crisis*. Nairobi, Kenya. www.irinnews.org/pdf/in-depth/Running-Dry-IRIN-In-Depth.pdf.

———. 2009a. Chad: Daily needs squeeze dwindling resources in east. April 24. www.irinnews.org/Report.aspx?ReportId=84107.

———. 2009b. Kenya: Drought exacerbating conflict among pastoralists. February 2. www.irinnews.org/Report.aspx?ReportId=82683.

———. 2009c. Kenya: The dangers of pastoralism. July 13. www.irinnews.org/Report.aspx?ReportId=85252.

Jacobsen, K. 2010. Internal displacement to urban areas: The Tufts-IDMC profiling study; Case 1: Khartoum, Sudan. Geneva, Switzerland: Feinstein International Center, Tufts University, in collaboration with Internal Displacement Monitoring Centre. www.scribd.com/fullscreen/5502724?access_key=key-dpm84w1o18p0ojbyj5s.

Jones, S. G., L. H. Hilborne, C. R. Anthony, L. M. Davis, F. Girosi, C. Benard, R. M. Swanger, A. D. Garten, and A. Timilsina. 2006. *Securing health: Lessons from nation-building missions*. Santa Monica, CA: RAND Center for Domestic and International Health Security.

Kelly, C. 2012. Mitigating the environmental impacts of post-conflict assistance: Assessing USAID's approach. In *Assessing and restoring natural resources in post-conflict peacebuilding*, ed. D. Jensen and S. Lonergan. London: Earthscan.

Lind, J. 2014. Manufacturing peace in "no man's land": Livestock and access to natural resources in the Karimojong Cluster of Kenya and Uganda. In *Livelihoods, natural resources, and post-conflict peacebuilding*, ed. H. Young and L. Goldman. London: Earthscan.

Matthew, R. A., J. Barnett, B. McDonald, and K. L. O'Brien. 2010. *Global environmental change and human security*. Cambridge, MA: MIT Press.

Matthew, R., and A. Hammill. 2012. Peacebuilding and adaptation to climate change. In *Assessing and restoring natural resources in post-conflict peacebuilding*, ed. D. Jensen and S. Lonergan. London: Earthscan.

Mayoral, A. 2012. Climate change as a conflict multiplier. Peace Brief No. 120. Washington, D.C.: United States Institute of Peace. www.usip.org/publications/climate-change-conflict-multiplier.

McCarthy, J., and D. Mustafa. 2014. Despite the best intentions? Experiences with water resource management in northern Afghanistan. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

McKenzie, D., and D. Mookhergee. 2005. Paradox and perception: Evidence from four Latin American countries. In *Reality check: The distributional impact of privatization in developing countries*, ed. J. Nellis and N. Birdsall. Washington, D.C.: Center for Global Development.

Meinzen-Dick, R., and L. Nkonya. 2005. Understanding legal pluralism in water rights: Lessons from Africa and Asia. Paper presented at the international workshop "African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa," Johannesburg, South Africa, January 26–28.

Noll, R., M. M. Shirley, and S. Cowan. 2000. Reforming urban water systems in developing countries. In *Economic policy reform: The second stage*, ed. A. O. Krueger. Chicago, IL: University of Chicago Press.

Palmer-Moloney, L. J. 2014. Water's role in measuring security and stability in Helmand Province, Afghanistan. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Pinera, J.-F., and R. A. Reed. 2014. A tale of two cities: Restoring water services in Kabul and Monrovia. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Raleigh, C., and H. Urdal. 2007. Climate change, environmental degradation and armed conflict. *Political Geography* 26 (6): 674–694.

ROL (Republic of Liberia) and UNDP (United Nations Development Programme). 2006. *National human development report 2006: Liberia*. Monrovia. http://hdr.undp.org/en/reports/nationalreports/africa/liberia/LIBERIA_2006_en.pdf.

———. 2010. *Republic of Liberia: Progress, prospects and challenges towards achieving the MDGs*; *Millennium Development Goals 2010 report*. Monrovia.

Salman, S. M. A. 2014. Water resources in the Sudan North-South peace process and the ramifications of the secession of South Sudan. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Schwartz, J., S. Hahn, and I. Bannon. 2004. The private sector's role in the provision of infrastructure in post-conflict countries: Patterns and policy options. Social Development Papers, Conflict Prevention & Reconstruction Paper No. 16. August. Washington, D. C.: World Bank. http://siteresources.worldbank.org/INTCPR/214578-1111996036679/20618754/WP16_Web.pdf.

Setchell, C. A., and C. N. Luther. 2009. Urban displacement and growth amidst humanitarian crisis: New realities require a new strategy in Kabul. *Monday Developments*. October. http://transition.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/sectors/files/urban_displacement_kabul_09.pdf.

Sharp, T. W., F. M. Burkle Jr., A. F. Vaughn, R. Chotani, and R. J. Brennan. 2002. Challenges and opportunities for humanitarian relief in Afghanistan. *Clinical Infectious Diseases* 34 (supplement 5): S215–S228.

Shiva, V. 2002. *Water wars: Privatization, pollution, and profit*. Cambridge, MA: South End Press.

Sphere Project. 2004. *Humanitarian charter and minimum standards in disaster response*. Geneva, Switzerland. http://ocw.jhsph.edu/courses/refugeehealthcare/PDFs/SphereProjectHandbook.pdf.

———. 2011. *Humanitarian charter and minimum standards in humanitarian response*. Geneva, Switzerland. www.sphereproject.org/resources/download-publications/?search=1&keywords=&language=English&category=22.

Sugiura, M., Y. Toguchi, and M. Funiciello. 2014. Irrigation management and flood control in post–World War II Japan. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Tearfund. 2007. Darfur: Relief in a vulnerable environment. Middlesex, UK. www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/Relief%20in%20a%20vulnerable%20envirionment%20final.pdf.

TI (Transparency International). 2008. *Global corruption report 2008: Corruption in the water sector*. New York: Cambridge University Press.

UCDP (Uppsala Conflict Data Program). n.d. UCDP database. www.ucdp.uu.se/gpdatabase/search.php.

UN (United Nations). 2009. *The Millennium Development Goals report 2009*. New York.

———. 2011. *Civilian capacity in the aftermath of conflict: Independent report of the Senior Advisory Group*. New York. http://civcapreview.org/Default.aspx?tabid=3735&ctl=Details&mid=6436&Itemid=3148&language=en-US.

———. 2012. Secretary-General's remarks to Opening Session of the General Assembly High-Level Forum on the Culture of Peace. www.un.org/sg/statements/index.asp?nid =6292.

UNDESA (United Nations Department of Economic and Social Affairs). n.d. Water scarcity. www.un.org/waterforlifedecade/scarcity.shtml.

UNEP (United Nations Environment Programme). 2004. *Desk study on the environment in Liberia*. Geneva, Switzerland.

———. 2011. *The Democratic Republic of Congo: Post-conflict environmental assessment—Synthesis for policy makers*. Nairobi, Kenya.

———. 2012. *Greening the blue helmets: Environment, natural resources and UN peacekeeping operations*. Policy Paper No. 3. Nairobi, Kenya. http://postconflict.unep.ch/ publications/UNEP_greening_blue_helmets.pdf.

UNGA (United Nations General Assembly). 2010. Resolution 64/292. A/RES/64/292 (2010). August 3. www.un.org/ga/search/view_doc.asp?symbol=A/RES/64/292.

UNHCR (Office of the United Nations High Commissioner for Refugees). 2009. Update on UNHCR's water programme. February 16. www.unhcr.org/49b4eb802.html.

UNICEF (United Nations Children's Fund) and WHO (World Health Organization). 2012. *Progress on drinking water and sanitation: 2012 update*. New York. www.unicef.org/ media/files/JMPreport2012.pdf.

UNSG (United Nations Secretary-General). 2009. *Report of the Secretary-General on peacebuilding in the immediate aftermath of conflict*. A/63/881–S/2009/304. June 11. New York. www.unrol.org/files/pbf_090611_sg.pdf.

———. 2010. *Progress report of the Secretary-General on peacebuilding in the immediate aftermath of conflict*. A/64/866–S/2010/386. July 16 (reissued on August 19 for technical reasons). New York.

———. 2012. *Peacebuilding in the aftermath of conflict: Report of the Secretary-General*. A/67/499–S/2012/746. October 8. New York.

UNSG's (United Nations Secretary-General's) Policy Committee. 2007. Conceptual basis for peacebuilding for the UN system. May. New York.

UN Water and FAO (Food and Agriculture Organization of the United Nations). 2007. Coping with water scarcity: Challenge of the twenty-first century. www.unwater.org/ wwd07/downloads/documents/escarcity.pdf.

USIP (United States Institute of Peace) and U.S. Army PKSOI (United States Army Peacekeeping and Stability Operations Institute). 2009. *Guiding principles for stabilization and reconstruction*. Washington, D.C.: Endowment of the United States Institute of Peace.

Vesilind, P. J. 1993. Water: The Middle East's critical resource. *National Geographic* 183 (5): 38–70.

Vidal, J. 2010. Kabul faces severe water crisis. *Guardian*, July 19. www.guardian.co.uk/ world/2010/jul/19/kabul-faces-severe-water-crisis.

Waldman, M. 2008. Community peacebuilding in Afghanistan: The case for a national strategy. Oxford, UK: Oxfam International. www.oxfam.ca/news-and-publications/ publications-and-reports/community-peacebuilding-in-afghanistan-the-case-for-a -national-strategy.

Waleij, A., T. Bosetti, R. Doran, and B. Liljedahl. 2014. Environmental stewardship in peace operations: The role of the military. In *Governance, natural resources, and post-conflict peacebuilding*, ed. C. Bruch, C. Muffett, and S. S. Nichols. London: Earthscan.

Water Aid. 2011. Off-track, off-target: Why investment in water, sanitation and hygiene is not reaching those who need it most. www.wateraid.org/~/media/Publications/water -sanitation-hygiene-investment.pdf.

Weinthal, E. 2002. *State making and environmental cooperation: Linking domestic and international politics in Central Asia.* Cambridge, MA: MIT Press.

Welle, K. 2008. Improving the provision of basic services for the poor in fragile environments: Water supply, sanitation and hygiene; International literature review. London: Overseas Development Institute. www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications -opinion-files/3603.pdf.

Westerkamp, M., M. Feil, and A. Thompson 2009. Regional cooperation in the Great Lakes region: A contribution to peacebuilding? Brussels, Belgium: Initiative for Peacebuilding. www.adelphi.de/files/uploads/andere/pdf/application/pdf/us_038_-_regional _cooperation_in_the_great_lakes_region.pdf.

Wolf, A. T. 2000. Indigenous approaches to water conflict negotiations and implications for international waters. *International Negotiation* 5 (2): 357–373.

Wolf, A. T., A. Kramer, A. Carius, and G. D. Dabelko. 2005. Managing water conflict and cooperation. In *State of the world 2005: Redefining global security*, ed. M. Renner, H. French, and E. Assadourian. New York: Norton.

Wolf, A. T., S. B. Yoffe, and M. Giordano. 2003. International waters: Identifying basins at risk. *Water Policy* 5 (1): 29–60.

World Bank. 2011. *World development report: Conflict, security, and development.* Washington, D.C.

———. 2013. Twenty fragile states make progress on Millennium Development Goals. May 1. Washington, D.C. www.worldbank.org/en/news/press-release/2013/05/01/twenty -fragile-states-make-progress-on-millennium-development-goals.

Zawahri, N. A. 2014. Refugee rehabilitation and transboundary cooperation: India, Pakistan, and the Indus River system. In *Water and post-conflict peacebuilding*, ed. E. Weinthal, J. Troell, and M. Nakayama. London: Earthscan.

Zeitoun, M., and J. Warner. 2006. Hydro-hegemony—a framework for analysis of trans-boundary water conflicts. *Water Policy* 8 (5): 435–460.