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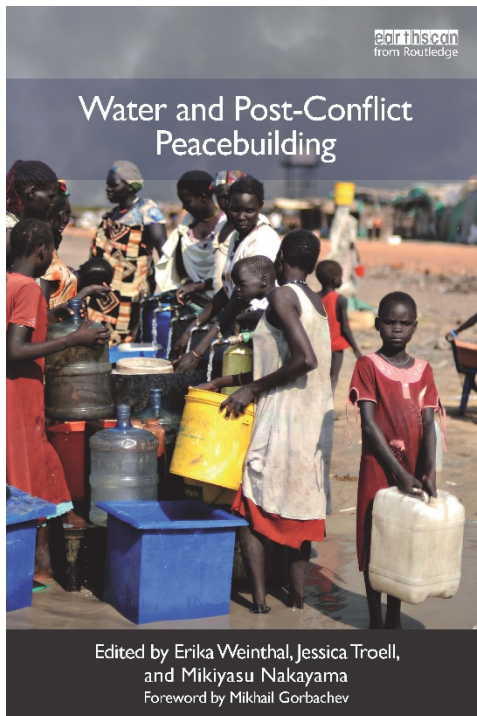
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Water's role in measuring security and stability in Helmand Province, Afghanistan

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Water's role in measuring security and stability in Helmand Province, Afghanistan

Laura Jean Palmer-Moloney

Clear. Hold. Build. According to counterinsurgency (COIN) doctrine employed in Operation Enduring Freedom by the International Security Assistance Force (ISAF) in Afghanistan, these operational stages lead to the security, stability, and sustainable economic growth necessary for building peace.¹ The application of COIN doctrine has temporal and spatial dimensions depending on the operational environment—ranging from relatively simple tactical decisions and actions to more complex strategic planning. In Afghanistan, such operations range from close personal dialogue between soldiers, marines, the civilian workforce, and local Afghan leaders to collaboration involving ISAF, U.S. government agencies (such as the Department of Defense, Department of State, Agency for International Development, and Department of Agriculture), and the government of the Islamic Republic of Afghanistan (GOIRA). From a U.S. military perspective, COIN operations are population-centric by design and demand action different from traditional “kinetic” military response (Flynn, Pottinger, and Batchelor 2010; Petraeus 2010; USACAC n.d.).

Despite the irreversible trajectory implied by the phases of COIN operations, *Clear* does not always lead to *Hold*, nor *Hold* to *Build*, as the ebb and flow of the post-conflict period in Helmand Province illustrate. Helmand is part

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¹ According to the counterinsurgency field manual (U.S. DOD 2009), a counterinsurgency (COIN) operation typically includes the following phases:

- (1) *Clear*: Create a secure physical and psychological environment.
- (2) *Hold*: Establish firm (host nation) government control of the populace and area, and gain the populace's support.
- (3) *Build*: Progress in building support for the host nation government requires protecting the local populace. People who do not believe they are secure from insurgent intimidation, coercion, and reprisals will not risk overtly supporting COIN efforts. The populace decides when it feels secure enough to support COIN efforts.



Figure 1. Regional command and control in Afghanistan prior to July 2010
 Source: ISAF (2010b).

of Afghanistan’s Taliban stronghold and was originally one of the six provinces comprising Regional Command (RC) South (see figure 1). As of July 2010, Helmand became one of the two provinces comprising RC Southwest (see figure 2).²

Since December 2009, ISAF has worked to oust the Taliban from areas determined to be the province’s key districts. Water’s significance in the economic development of Helmand is understood and clearly linked to numerous ISAF and U.S. government interagency activities. However, water’s significance in near-term COIN operations and as a “proxy observable” (that is, indicator) to measure COIN operational success is underappreciated, if it is considered at all. The purpose of this chapter is to assess the role of water in peacebuilding, co-operation, and confidence building in the early phases of COIN operations when security and stability are not guaranteed.

² As part of the ISAF design, the regional commands in Afghanistan coordinate regional civil-military activities conducted by the military elements of the provincial reconstruction teams. In May 2010, the North Atlantic Council of the North Atlantic Treaty Organization gave the go-ahead for the reorganization of Regional Command (RC) South into RC South and RC Southwest. Since July 2010, RC South has included Uruzgan, Zabul, Day Kundi, and Kandahar provinces, and RC Southwest has included only Helmand and Nimroz provinces.

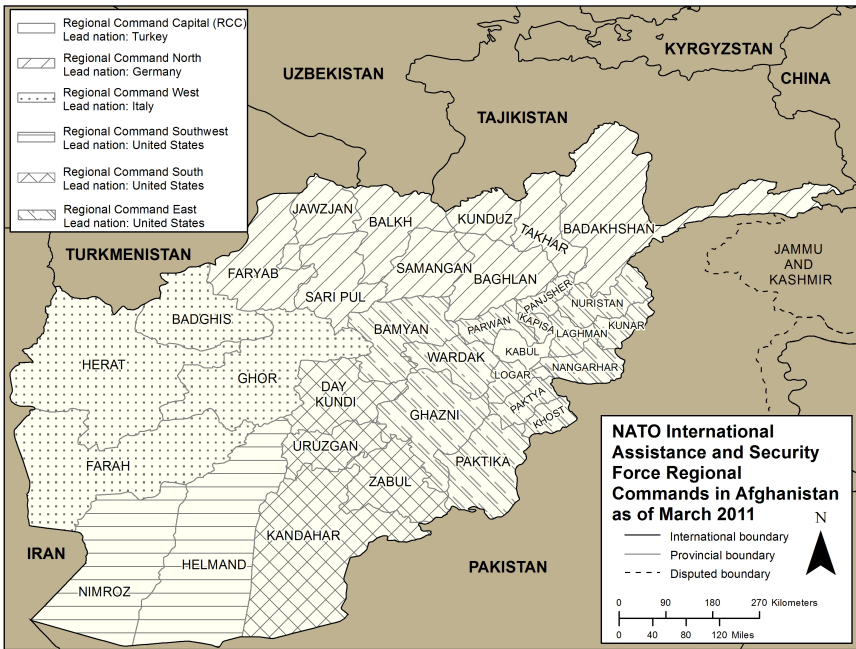


Figure 2. Separation of Regional Command (RC) South into RC South and RC Southwest

Source: ISAF (2011).

The chapter focuses on Helmand Province from summer 2009 to autumn 2010, just before and during the U.S. military surge of forces. During this time, efforts to consolidate peacebuilding were linked to three overarching areas—security, governance, and development. Yet in the midst of peacebuilding, for many, the conflict was still ongoing. This chapter highlights the fragility, instability, insecurity, and violence that characterize many post-conflict areas. Though Afghanistan (and Iraq) pose unique cases, as long as the U.S. military uses COIN doctrine, the type of war fought there may increasingly become the norm: militaries and their contractors may undertake work that was once delegated to humanitarians. This chapter provides insight into some of the challenges faced when traditional roles become blurred and change to fit this new paradigm.³

BACKGROUND

The Bonn Agreement, signed in December 2001, created a framework for the transition of Afghanistan from Taliban rule to a new Afghan national government and effectively began Afghanistan’s post-conflict period. Delegates at the United

³ For an analysis of civil-military activities broadly, see Civic (2014).

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Nations-sponsored event in Germany did not address the country's natural resource base or natural resource management issues. Seven years later, the Afghan National Development Strategy, 2008–2013 (GOIRA 2008),⁴ which outlined the country's reconstruction goals (security, governance, economic growth, and poverty reduction), did not address natural resources or resource management (U.S. GAO 2010). Though the Water Strategy for Afghanistan, 2009–2014 links water to the Afghan National Development Strategy's reconstruction goals, most decision makers fail to appreciate water's importance to near-term governance, security, and development success in Afghanistan (USG 2010).

Water is one of Afghanistan's most important resources. But the unequal distribution of water leads to regional loss of livelihoods and population displacement. As archaeological and historical records show, the country's unequal distribution of water has created what may be termed "environmental refugees" and internally displaced persons as affected populations move in search of basic needs during times of drought and severe flooding (Adamec 1973; Breshna 1988; Whitney 2006). Unequal distribution of potable water can be seen in the economic disparities of Afghanistan's population. Generally speaking, densely populated urban centers, such as Herat, Lashkar Gah, Kandahar, and Mazari-Sharif, are relatively wealthy and are populated by people whose most basic needs are met to some degree.

But in Afghanistan's relatively poor rural areas and in the country's informal urban squatter settlements, where essential services are often lacking, people may not have access to potable water, one of the most fundamental human needs (USAID 2010). In these poor, underserved areas, Afghanistan's insurgents have had the most influence (Gallup 2009).

In September and October 2009, Gallup conducted a survey in ISAF's key terrain areas, including accessible districts of Helmand Province. Local Afghans, trained to conduct the survey, questioned individuals to determine the population's view of the job market, standard of living, and perceptions of the strength and momentum of the local and national economies. The Gallup research showed that individuals in Helmand Province who regarded the Taliban positively had a much more pessimistic opinion of the country's condition. Though safety and security topped their list of concerns, access to health care, trash collection, and potable water were also significant (Gallup 2009).

The Gallup research revealed two types of insurgents, differentiated as Type One and Type Two. Type One insurgents are ideologically based, elitist, intolerant, lack confidence in government, thrive in areas where hardship or

⁴ The Afghan National Development Strategy, 2008–2013 was replaced in 2010 by the Afghan National Development Strategy: Prioritization and Implementation Plan, 2010–2013 (GOIRA 2010). Both water resources and general natural resource management are mentioned in the newer document. However, for nine years (2001–2010), natural resource management was not addressed.

concern for safety exists, and are not demographically distinct. Type Two insurgents search for leaders, accept violence, seek gains in economic and social status, and view themselves as victims. Some are heads of households trying to support families, and some are young men who want to prove themselves to their communities as they come of age.

Gallup’s findings can be linked to water’s role in post-conflict peacebuilding in Helmand. If there is hardship or illness caused by lack of water or poor water quality, the environmental circumstances could give Type One insurgents an opportunity to sway the affected population to their side. Lack of potable water could also reinforce Type Two insurgents’ feelings of victimization and further limit their livelihoods and alternatives.

Water resource management unites the ISAF and GOIRA through diplomacy and development. As noted in the Water Strategy for Afghanistan, 2009–2014, water is essential for the country’s development and has “a dramatic and every day effect on agricultural productivity, economic growth, health, education, quality of life, and political and social stability” (USG 2010, 3). Water must move beyond resource management if it is to advance post-conflict peacebuilding efforts in Helmand Province. Knowledge of district and provincial water complexities is needed to gain a rich contextual insight into the area’s security and stability. *Water complexities*, as used here, relate to intricacies that must be understood in order to critique water’s role in a given area of interest. The intricacies, or characteristics, are water supply, water quality, water availability, and water accessibility (see table 1). All are interrelated: changes in any one characteristic often affect the others, and all are linked to security and stability in peacebuilding.

By 2009, the civilian and military leaders of ISAF realized that successful COIN operations must include positive interaction with the local population in the Hold and early Build phases of an engagement. As 2010 drew to a close, water-complexity questions were just beginning to be used to analyze security and stability situations in areas of interest (Palmer-Moloney et al. 2010).

Table 1. Water complexity definitions

<i>Characteristic</i>	<i>Definition</i>
Supply	The quantity of water necessary for a variety of uses.
Quality	The chemical, physical, and biological characteristics of water, usually with respect to its suitability for the variety of uses.
Availability	The capability of the water source to meet the variety of uses.
Accessibility	The socio-cultural and transaction cost (time, distance, money) of acquiring water supply, for example, ability of community to travel spatially and temporally as well as percentage of monies spent.

Source: Palmer-Moloney et al. (2010).

Note: Each definition is subject to spatial-temporal variability.

THE GEOGRAPHIC SPACE

Helmand Province is located in southwestern Afghanistan and shares a border with Pakistan. Except for the mountainous northern reaches of the province, which receive snow, Helmand is a plateau with rocky outcroppings averaging 1,000 meters in elevation with steppe and desert climate zones.

The Helmand River drains approximately 40 percent of the country (Whitney 2006), and snowmelt in the upper reaches of the watershed supplies the river with most of its water (see figure 3 for location of Helmand River watershed). In a normal hydrological year, the Helmand River flows at its fullest between March and June, but the river system has experienced dramatic declines in flows in recent years (Chirico 2009). Satellite data show that, on May 9, 2010, the snow water–equivalent volume of the Helmand watershed was below normal compared to volumes during the twenty-two-year period of 1987–2009, confirming that drier than average conditions prevail.⁵



Figure 3. Helmand River watershed, Afghanistan

Source: Adapted from base map of Helmand watershed provided by U.S. Army Corps of Engineers, Army Geospatial Center.

⁵ U.S. Army Geospatial Center’s Hydrologic Analysis Team (AGC-HAT), personal communication, October 20, 2010.

Because of drought conditions and poor water management practices, the amount of available surface water in the system remains below normal.⁶ Field reports and remote-sensing analysis indicate an increase in the number of groundwater wells dug for water consumption and irrigation since 1998 (USAGC 2009).

Generally, when studying a watershed, the presence or absence of surface water and the location of wells can be seen and mapped using traditional field methods and remote sensing–image techniques. The amount of surface water in the system can be quantified relatively quickly using any number of measuring devices in field or geospatial modeling–image analysis. But the quality of water is more challenging to gauge because of the numerous physical, chemical, and biological factors considered and because the tests are more labor and time intensive.⁷

Poor water quality is a problem across Afghanistan (Berkley 2010; Bonventre 2010), and most concerns relate to bacterial contamination caused by untreated wastewater and high levels of dissolved solids. Bacterial contamination in Afghanistan is particularly vexing because wastewater treatment is almost nonexistent. The shallow wells commonly used in villages access water from the unconfined water-table aquifer, which may be contaminated by wastewater leaching from the surface.⁸

Today, most of the information available on the quantity and quality of well water from villages in Helmand Province is from nonscientific observations or ad hoc testing.⁹ The limited available scientific data substantiate anecdotal reports that water drawn from the unconfined water-table aquifer is contaminated not only with bacteria but also with a high concentration of dissolved salts. According to a 2002 report from the U.S. Army Corps of Engineers, well water with values above 1,500 milligrams per liter (mg/L) total dissolved solids can be expected in many parts of Helmand Province,¹⁰ in marked contrast to the mid-1970s when the area was known for its fresh, sweet well water (USAGC 2002; see figure 4).

⁶ S. R. Kikkeri, environmental program manager, Trans-Atlantic Division of the U.S. AGC-HAT, personal communication, October 20, 2010.

⁷ The physical, chemical, and biological characteristics of water quality include temperature, pH, turbidity, total dissolved solids, and presence or absence of microbes, as well as color, taste, and odor.

⁸ An aquifer is a rock unit that will yield water in a usable quantity to a well or spring. (In geologic usage, *rock* includes unconsolidated sediments.) Where water only partly fills an aquifer, the upper surface of the saturated zone is free to rise and decline. The water in such aquifers is said to be unconfined, and the aquifers are referred to as *unconfined aquifers*, or *water-table aquifers*. Unconsolidated deposits important in groundwater hydrology include, in order of increasing grain size, clay, silt, sand, and gravel (Heath 2004). Surface water and shallow groundwater are prone to exhibit poor quality. Generally, groundwater from deep wells in confined aquifers is free from disease-causing microorganisms.

⁹ S. R. Kikkeri, personal communication, October 20, 2010.

¹⁰ Water is considered fresh if the concentration of dissolved solids is less than 1,500 mg/L, brackish if between 1,500 and 15,000 mg/L, and saline if greater than 15,000 mg/L.

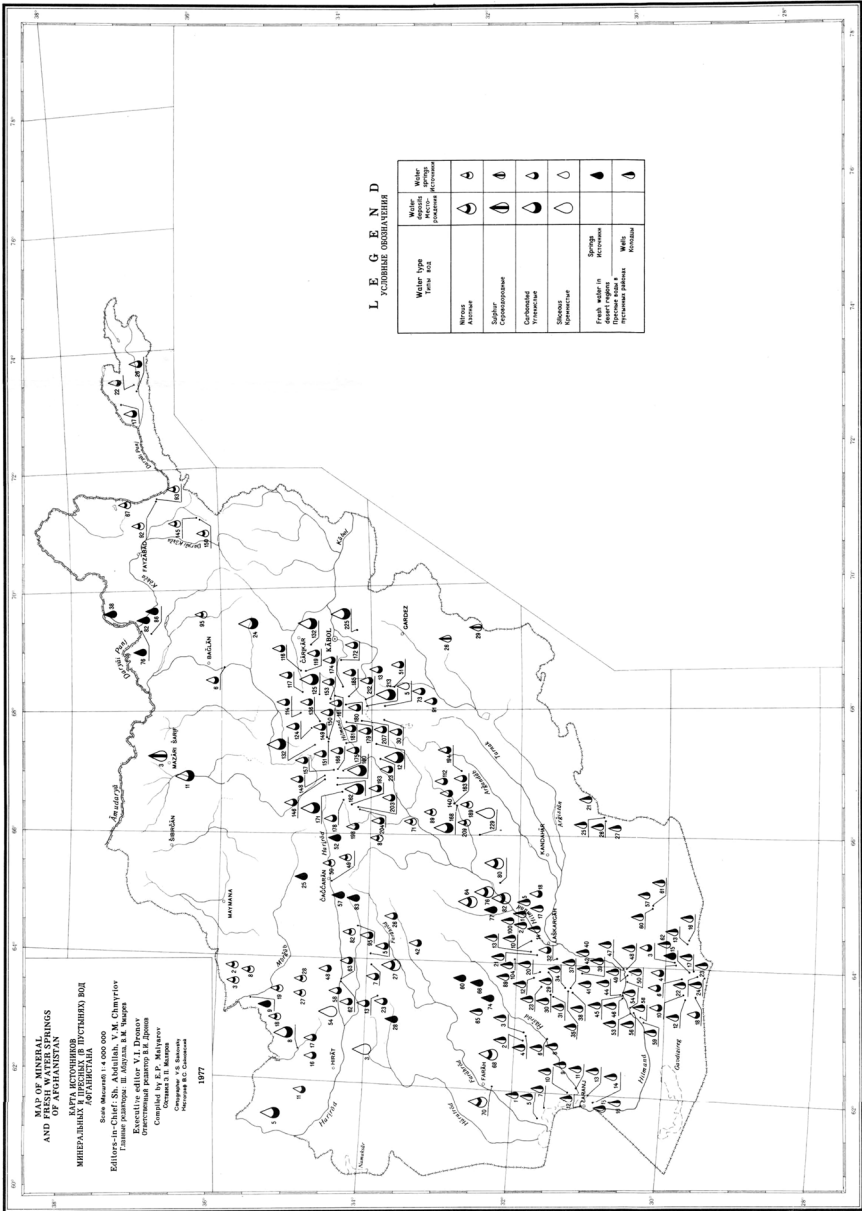


Figure 4. Map of mineral and freshwater springs of Afghanistan, mid-1970s
 Source: Abdullah and Chmyriov (1977), reprinted with permission from East View Geospatial, Inc.

For Helmand Province, there is no comprehensive record of the number of wells that have been dug or drilled; no documentation of changes in the water table over time; and, at the time of writing, no scientific, ongoing collection and sharing of groundwater-quality data. Hand-dug wells require no permits, and there are hundreds of hand-dug wells—some producing potable water, some not producing any water at all.¹¹ High-capacity wells drilled by nongovernmental organizations (NGOs) and by ISAF contractors often pull water from local wells and frequently cause them to run dry. Across the study area, groundwater levels are dropping because of drought conditions and water withdrawn from aquifers that cannot be recharged quickly enough by the hydrological cycle.¹² Thus, groundwater is an unsustainable solution to water-scarcity problems.

HELMAND PROVINCE: POST-CONFLICT PEACEKEEPING IN THE MIDST OF A TROOP SURGE

In February 2010, ISAF and Afghan National Security forces began Operation Moshtarak in an effort to clear the Taliban from the region southwest of Lashkar Gah, the provincial capital of Helmand. The operation was supposed to be “the first blow in a decisive campaign to oust the Taliban from their spiritual homeland in adjacent Kandahar province, one that [General] McChrystal [commander of ISAF] had hoped would bring security and stability to Marjah and begin to convey an ‘irreversible sense of momentum’ in the U.S.-led campaign in Afghanistan” (Nissenbaum 2010). Still, “[t]here aren’t enough U.S. and Afghan forces to provide the security that’s needed to win the loyalty of wary locals. The Taliban have beheaded Afghans who cooperate with foreigners in a creeping intimidation campaign. The Afghan government hasn’t dispatched enough local administrators or trained police to establish credible governance, and now the Taliban have begun their anticipated offensive” (Nissenbaum 2010). Whether the peace accord was signed in 2001 or not, reports by Dion Nissenbaum and others illustrate that, at the time of writing, those living in Helmand Province may challenge declarations that they are living in a post-conflict environment (Chandrasekaran 2010; Dominguez 2010).

Bringing water to the table: A Washington perspective

On July 2, 2009, the U.S. Marines launched Operation Khanjar in Helmand Province, and one month later, the U.S. Department of Defense initiated the Helmand Deep Dive research project. The goal of the project was to develop a “rich contextual understanding” of Helmand Province that could be used to

¹¹ U.S. AGC-HAT, personal communication, October 20, 2010; S. R. Kikkeri, personal communication, October 20, 2010.

¹² U.S. AGC-HAT, personal communication, October 20, 2010; S. R. Kikkeri, personal communication, October 20, 2010.

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strengthen and support COIN operations. From August 2009 to February 2010, experts from U.S. government agencies and academia worked with coalition forces in the field to answer fundamental questions about the operational environment and those individuals ISAF was trying to “protect and persuade” (Flynn, Pottinger, and Batchelor 2010). Originally, the research plan focused on human factors—behavioral psychology, sociology, cultural anthropology, history, economics, and political science—with no regard to human geography, water, or human-environment interactions. By the end of the research and reporting period, however, the briefings presented to the civilian and military decision makers laid out the significance of water to the security and stability of the region. This shift occurred as a result of the work done by an interagency geography and geoscience research team composed of scientists from the U.S. Army Corps of Engineers Engineer Research and Development Center (USACE-ERDC), in Alexandria, Virginia; the U.S. Geological Survey, in Reston, Virginia; and the U.S. Department of State Office of the Science and Technology Advisor to the Secretary. The interagency team joined Helmand Deep Dive in November 2009 (Palmer-Moloney et al. 2009).

The rapid turnaround time set for the Helmand Deep Dive, combined with travel constraints and the limited amount of data available, defined the research parameters. Nevertheless, the interagency research team was able to review and analyze archival records (written documents and aerial photography, circa 1950–1978), satellite images (1975–present), geospatial information collected by U.S. forces, and maps of the Helmand River watershed. Ground-level empirical work during the research timeframe was restricted because, for all intents and purposes, Helmand Province was at war.

The conclusions reached by the geography and geosciences research team are as follows:

- Water has a determinative impact on the drug trade, population movement, agriculture and livestock, energy, and public works in the region.
- Increases in economic activity, employment, and livelihood opportunities, which are critical to improving confidence in and popular support for the GOIRA, will most likely occur through agriculture. Humanitarian assistance supported by NGOs, the U.S. Agency for International Development (USAID), and ISAF require a reliable supply of water. Economic and assistance programs must be supported by investment and improvements in water infrastructure and sustainable watershed management.¹³
- Though many institutions (for example, NGOs, USAID, U.S. Military Command, and the international community) are involved in water projects in the province, there is no coordinated watershed management to monitor

¹³ Helmand Province’s water infrastructure was built with U.S. support (1950–1978), destroyed by the Soviets (1980s), and left in disrepair during the civil war and Taliban regime (1989–2001).

and assess water quantity and quality in the basin. There are innumerable ad hoc projects and little oversight of project effects and outcomes. Consequently, water sector projects upstream can divert water, adversely affecting downstream communities. High-capacity wells may draw water from smaller capacity wells, and overall withdrawal rates may be unsustainable.

- ISAF efforts to stabilize Afghanistan must balance near-term gains in agricultural production with the potential for increased transboundary conflicts over water and exhaustion of Afghanistan's water resources. Actions must focus on improving resource policy and management capacity and effectiveness, with special attention to increasing efficiency of water quantity and quality monitoring and assessment.¹⁴
- There is sparse, uncoordinated data collection on the depth of groundwater. In unconfined and confined aquifers, the water level is dropping as a result of drought and groundwater overdraft. In northern Helmand Province, the decrease is evidenced by the number of traditional *karez* wells that have run dry in recent years.¹⁵ Augmenting reduced surface-water flow by tapping the unconfined water-table aquifer and withdrawing from the deeper, confined groundwater sources is not a sustainable alternative when the amount of withdrawal is greater than the rate of groundwater recharge. From environmental-security and population-stability perspectives, the recharge rates of the aquifers need to be established and monitored, and plans need to be in place for what to do if or when the wells run dry.
- There is no coordinated, cross-ministry, ongoing, watershed-scale water quality data collection and dissemination or analysis. Data about water quality are more difficult to come by than surface-water and groundwater supply data (Uhl 2003). Little information is found in the literature; most reporting is anecdotal. Water quality is fundamental to public health in the province. Those who collect, disseminate, and analyze water-quality data can support post-conflict peacebuilding by working with communities to build an environmental baseline, track water contamination, and examine the socio-cultural (power and control) factors and transaction costs (time, distance, and money) related to accessing potable water. Watershed-data collection and sharing are needed for integrated water resource management, which is part of the foundation for dialogue on and resolution of water issues.

¹⁴ For a more complete discussion on this topic, see Alex Dehgan, Laura Jean Palmer-Moloney, and Mehdi Mirzaee, "Water Security and Scarcity: Potential Destabilization in Western Afghanistan and Iranian Sistan and Baluchestan Due to Transboundary Water Conflicts," in this book.

¹⁵ A *karez* is a hand-dug water supply system (also known as *qanat*) common in arid regions of central and southwest Asia. It taps underground mountain-water trapped in and beneath the upper reaches of alluvial fans and channels the water downhill through a series of tunnels, often several kilometers long, to the places where it is needed for irrigation and domestic use.

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- Efforts need to be focused on gathering and disseminating accurate information on the current water budget (surface and groundwater demand versus available supply) of the Helmand watershed because *water cannot be managed if it cannot be measured*. At present, the only water data regularly collected in Afghanistan are on the Kabul River Basin,¹⁶ which is located in northeastern Afghanistan and formed by the Paghman Mountains to the west and the Kohe Safi Mountains to the east.

Bringing water to the COIN operational environment: A perspective from Operation Enduring Freedom, Afghanistan

ISAF civilian and military commanders in Helmand Province have had difficulty finding measurements that can be used to determine the degree of success of COIN operations. As seen in the examples that follow, water can serve as a proxy observable to gauge headway (or lack thereof) in operations related to security, governance, and development.

Water and provincial reconstruction teams, civilian-military operations, and the Tactical Conflict Assessment and Planning Framework (TCAPF)

After the signing of the Bonn Agreement in 2001, provincial reconstruction teams (PRTs) of military civil affairs soldiers, National Guard members, and Afghan civilians were set up in key Afghan provinces. But the civilian-military effort was inconsistent, unplanned, and lacked overarching goals and strategic guidance for nearly nine years. Since COIN doctrine was adopted in Afghanistan in 2009, every PRT commander has been given a copy of the *Provincial Reconstruction Team (PRT) Handbook*. According to the guiding principles, a PRT should “[f]ocus upon improving stability by seeking to reduce the causes of instability, conflict, and insurgency while simultaneously increasing the local institutional capacity to handle these on their own” (ISAF 2010a, 4). Furthermore, a PRT must work to reduce the destabilizing threats and their underlying causes while building the capacity of local institutions to counteract the destabilizing causes with minimal ISAF support (ISAF 2010a). Water supply, quality, availability, and accessibility were not included as destabilizing threats, and civilians selected and sent to the PRT commands were not chosen because of their hydrology or water resource management skills (MRRD-NABDP n.d.; Leppert 2010).

By April 2010, the role of the Helmand PRT was understood—to support the GOIRA.¹⁷ The PRT leaders were aware that the GOIRA was susceptible to appearing incompetent if the locals had unrealistic expectations regarding the

¹⁶ V. Schneider, senior research scientist, International Water Unit, U.S. Geological Service, personal communication, June 30, 2010, and March 22, 2011.

¹⁷ R. Donohoe, USAID agriculture program manager, Helmand Province, personal communication, April 19, 2010.

level of basic services the government was able to offer them. However, they were sure that the Afghan government could not afford to fail if called upon for dispute resolution pertaining to landownership and particularly issues involving water rights (USAID 2009). To address the PRT's goals and meet the expectations that came with COIN doctrine, the Helmand PRT encouraged use of a survey instrument developed by USAID to help determine local stability (Whittington 2009; Baranick and Wilkinson 2010; Montgomery 2010; U.S. MCCLL 2010). The Tactical Conflict Assessment and Planning Framework (TCAPF) tool was designed to help users understand complex situations from a people-centered perspective, recognize and target sources of instability, and determine ways to gain traction with local populations (Whittington 2009; Baranick and Wilkinson 2010; USAID 2010).

In 2009, a Marine Corps Civil Affairs Group was charged with taking TCAPF surveys of Helmand Province (Whittington 2009). They determined that in the rural countryside and squatter settlements of Lashkar Gah, most local Afghans' requests for assistance centered on water, with specific calls for digging wells and reconstructing canals to improve irrigation. Most appeals were for help acquiring potable water for consumption (Baranick and Wilkinson 2010) (see figure 5). As a result, wells have been dug and pumps installed, but the question

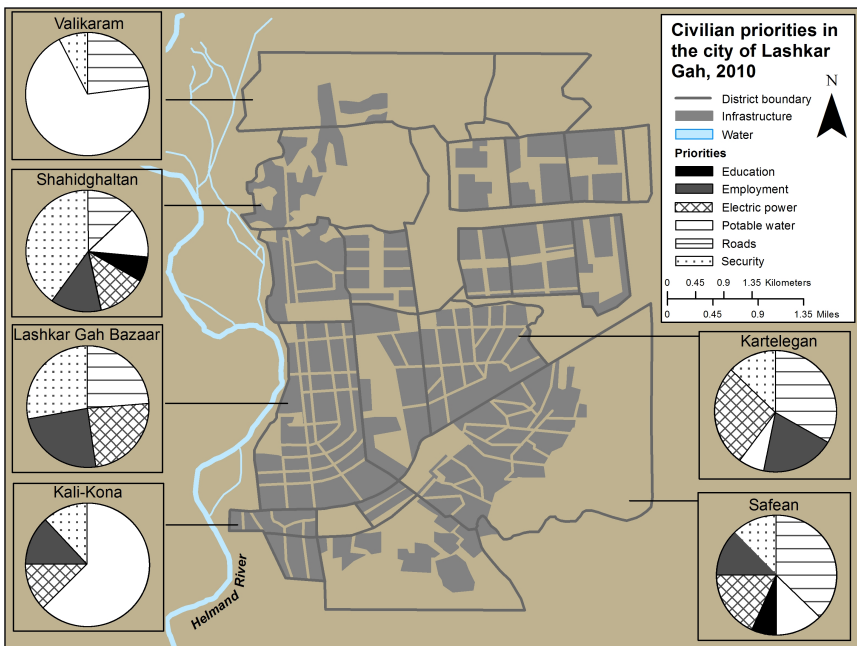


Figure 5. Civilian priorities in the city of Lashkar Gah, Afghanistan, 2010

Sources: USAID (2010); Baranick and Wilkinson (2010).

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remains: Did the response yield sustainable potable water for communities in need? Drilling wells in areas with dropping water tables requires digging ever deeper. Drilling deeper for water calls for money, as does the energy needed to pump water from deep wells, and money is a critical limitation for the people of Helmand Province.

Afghan Sustainable Water Supply and Sanitation project

The USAID-funded Afghan Sustainable Water Supply and Sanitation (SWSS) project is meant to assist national and local government agencies, PRTs, and other stakeholders in the design, installation, and operation of sustainable potable water systems, sanitation facilities, and hygiene-education programs. The goal of SWSS is to apply a holistic approach to providing clean drinking water and improved sanitation for communities in parallel with their engagement in Community-Led Total Sanitation (CLTS) interventions (USAID 2009). According to the USAID program description, CLTS will be carried out through a network of experienced NGOs mandated to provide the Afghan Basic Package of Health Services on the provincial and community levels.¹⁸ SWSS's activities primarily focus on rural areas, but may reach urban areas. Because SWSS is a demand-driven mechanism, it serves no specific province or district.

Potable water supply and sanitation projects for consideration under SWSS are identified by the PRTs and USAID field program officers (FPOs), based upon the requests of the receiving populations. The FPOs work closely with the communities, local authorities, and other stakeholders in their areas of operation to identify and nominate subprojects, which can include education and awareness-raising activities.¹⁹

The main limitations to SWSS's success in Regional Command (RC) South and RC Southwest are procuring reliable construction subcontractors and the operation and maintenance follow-up to engage poor communities in the upkeep of their newly installed infrastructure. The restraints are directly related to the nonpermissive, insecure environment and the threat level for all those working with ISAF and GOIRA projects.²⁰

As summer 2010 progressed, Taliban influence and control in many Helmand districts continued. Even with financial backing from USAID, SWSS had not moved into Helmand Province because of security concerns. In the meantime,

¹⁸ More information on the Afghan Basic Package of Health Services can be found online on the Afghanistan Ministry of Public Health web site, www.msh.org/afghanistan/pdf/Afghanistan_BPHS_2005_1384.pdf, and on the USAID/Afghanistan web site, http://afghanistan.usaid.gov/en/USAID/Activity/125/Health_Services_Delivery_Grant_Partnership_Contracts_for_Health_PCH.

¹⁹ G. Saleh, water program manager, USAID Afghanistan, personal communication, May 31, 2010.

²⁰ M. Gottlieb, program expert, USAID-contracted Afghan SWSS project, personal communication, May 31, 2010.

water needs continued to mount in the province's rural areas. "Tipping-point" communities wait for someone to deal with their water needs, and they may not have the patience to wait for SWSS/USAID and GOIRA to bring solutions. In the meantime, the Taliban do not have the capacity to step in and offer these services, although they can point out services GOIRA has failed to provide.

Water-sector proxy observables for ISAF Joint Command metrics

In the spring of 2010, to formulate metrics for the COIN effort, the ISAF Joint Command identified eleven key objectives. Among them were increasing the availability of essential services and improving agricultural development and productivity.²¹ Water is a crosscutting resource that affects programs and projects of the PRTs, the ISAF Joint Command, and GOIRA national and subnational government entities (for example, the Ministry of Agriculture, Irrigation, and Livestock; the Ministry of Rural Rehabilitation and Development; the National Solidarity Programme; and the Community-Based Natural Resources Management Program). Water connects the COIN lines of operation, linking governance, development, and security.

By the fall of 2010, a growing number of policy makers and decision makers designing COIN metrics understood that water sector data (for example, water supply, quality, availability, and accessibility) could be used as tangible proxy observables to measure COIN operational progress. Though the ISAF Joint Command's intelligence center was briefed on the significance of water to short-term, midterm, and long-term success in Afghanistan, ISAF leaders in Helmand Province were captivated by higher-visibility items, such as increasing electricity supply in Kandahar. Though community leaders and GOIRA ministers were also anxious to expand the electric grid to support economic growth (Palmer-Moloney 2010; MRRD-NABDP n.d.), many communities in RC South and RC Southwest continued to live without reliable water supplies, potable water sources, and wastewater treatment.

As COIN doctrine drove operations in Afghanistan, the USACE-ERDC in Alexandria, Virginia, became involved in developing a methodology to examine the interaction of people and the environment at the cultural (human) and hydro-physical (watershed) local levels. The goals of the Civil-Military Operations–Human Environment Interaction (CMO-HEI) research are to address water issues specific to time, place, and culture and generate context-rich information for analysis and produce methodology and models that support actionable analysis for decision making. The CMO-HEI pilot program for Helmand Province was aimed at district-level analysis of water's relationship to environmental security and regional stability. To assist with community support and situation analysis, the CMO-HEI team developed a comprehensive list of questions on water

²¹ Access to water is but one essential service. Others include electricity, transportation, communication, infrastructure, education, water and sewage treatment, and health care.

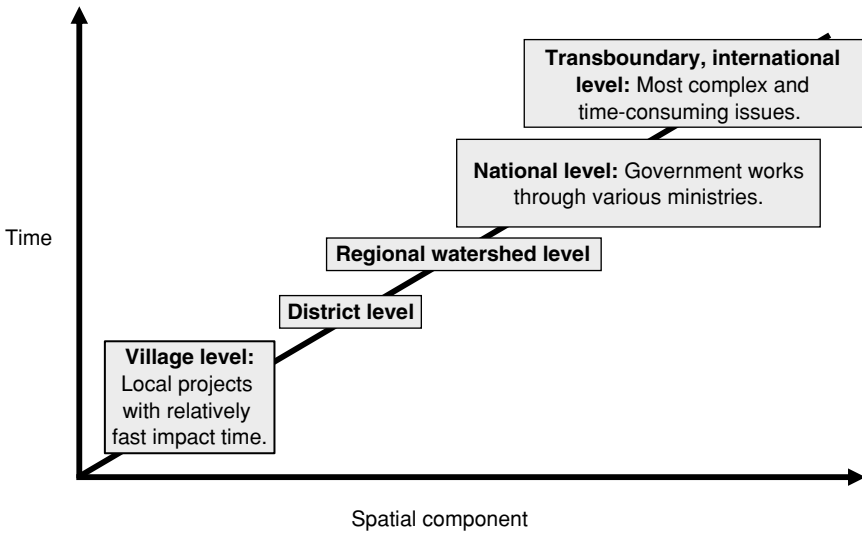


Figure 6. Spatial and temporal aspects of water complexity questions and answers

Source: Palmer-Moloney et al. (2009).

Note: At the national level, the government of the Islamic Republic of Afghanistan worked with the Independent Directorate of Local Governance; the Ministry of Agriculture, Irrigation, and Livestock; the Ministry of Energy and Water; the Ministry of Public Works; and the Ministry of Rural Rehabilitation and Development.

and a conceptual model that linked questions to ISAF goals, COIN metrics, and associated development indicators.

At the time of writing, the impact of the pilot program was yet to be determined. As of December 2010, the U.S. Marines in RC Southwest, U.S. Army National Guard Agribusiness Development teams in RC South, and the Kandahar City Water Project team were preparing to initiate water complexity–data collection. As ISAF commanders and Afghan government officials prepare to shift from ISAF to GOIRA lead in Afghanistan, answers to questions on water can be used to help determine district and province readiness for transition. Iterative use of the questions and answers can also support post-conflict peacebuilding by helping decision makers connect water complexities to local and regional security and stability (see figure 6).

IDENTIFIED CONSTRAINTS AFFECTING WATER AND PEACEBUILDING IN THE HELMAND BASIN

There are four identified constraints affecting water and peacebuilding in the Helmand Basin: weather variation and climate change–related uncertainties, unsustainable groundwater withdrawal, water contamination, and Helmand Province’s insecure and nonpermissive environment.

Weather variation and climate change

Weather variation and climate change–related uncertainties will affect water quantity and quality in Helmand Province. For the ten-year period (1998–2008), Afghanistan was seriously affected by drought conditions, which led to critical shortages of surface water, falling groundwater tables, substantially below-average agricultural yields, and increased concentrations of contaminants in the available water supply. The drought destroyed fragile coping mechanisms in rural communities and, according to a report from the Danish Committee for Aid to Afghan Refugees (DACAAR 2002), it—at least temporarily—undermined many rehabilitation and development achievements of the past decade. Furthermore, hotter temperatures and lower water in the snowpack associated with regional climate change set back the region’s food security, stability, and economic development water sector initiatives (LLNL 2009). Adaptive management techniques need to be incorporated so that affected plans and communities have a number of options for climate adaptation and information on which to base their decisions (UN 2010; USAID n.d.).

For surface-water management and natural resource planning, knowledge of the magnitude and time distribution of streamflow is essential. The agencies responsible for the development and management of Afghanistan’s surface-water resources need these data for making environmentally sound water resource–planning decisions. Though the U.S. Geological Survey—in cooperation with USAID—computed streamflow statistics for data collected at historical gauging stations within the Helmand Basin, no consistent, reliable streamflow data have been collected since September 1980 (Williams-Sether 2008). During many of the years without records, Afghanistan and other countries of Central Asia were in the throes of a drought that devastated the natural environment.

Unsustainable groundwater withdrawal

The current rate of groundwater withdrawal is not sustainable. The last surface-water gauging of the Helmand Basin was in the late 1970s, before the Soviet invasion. As revealed through extensive research of historic records, there has never been a coordinated collection of data on groundwater levels or quality (Palmer-Moloney et al. 2009, 2010). Recent drought conditions in the Helmand Basin caused the unconfined groundwater table to drop. The drop has been compounded by ad hoc pumping projects implemented by NGOs and ISAF to supply water to communities in need.

DACAAR reports illustrate uncoordinated and possibly unsustainable groundwater solutions in Helmand Province (DACAAR n.d.). DACAAR involved communities in planning and maintenance of new wells, but because no one officially oversaw the water sector—demonstrating the governance vacuum in the country—there was no indication that DACAAR coordinated pump installations effectively with any public works office or any water resource–oversight

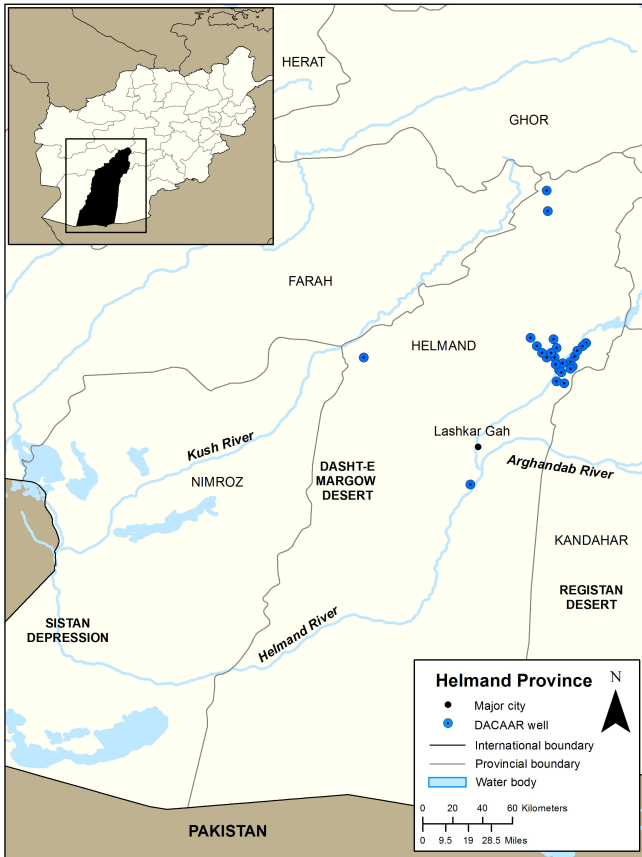


Figure 7. Location of wells monitored by the Danish Committee for Aid to Afghan Refugees in Helmand Province, Afghanistan

Source: DACAAR (n.d.).

group (DACAAR 2005, 2000, n.d.; see figure 7 for the locations of DACAAR-monitored wells). Although there are national laws in place to regulate well drilling and groundwater withdrawal, the control mechanisms are insufficient to require provinces to adhere to the laws.²² As a result, neither Afghanistan nor the international community was able to manage these efforts, and groundwater extraction has continued in an unmanaged—and ultimately unsustainable—manner.

²² North Atlantic Treaty Organization (NATO) officials and Afghan ministry officials, NATO System Analysis and Studies COIN metrics workshop, NC3A, The Hague, Netherlands, personal communication, December 6–10, 2010.

The challenges of sustainably managing Afghanistan's groundwater are exacerbated by an ongoing drought, which has led to falling water tables and substantially below average agricultural yields.²³ The drought has destroyed fragile coping mechanisms in rural communities and temporarily undermined many of the achievements of the rehabilitation and development efforts during the past decade. As a result, assistance resources have had to be moved away from development programs into a comprehensive relief effort. The continuation of this drought could have significant impacts on the assistance strategies of humanitarian and development agencies. Digging a well does not guarantee water, and putting in wells with no watershed-level coordination or accountability can lead to tension and exponential complications.

Water contamination

Levels of surface and groundwater contamination must be monitored. Many wells are dug to yield a clean alternative to water from bacterially contaminated surface-water sources. However, shallow groundwater from unconfined aquifers is likely to be polluted due to lack of proper waste disposal and sewage treatment in the study area.

Insecure and nonpermissive environment of Helmand Province

As long as significant portions of Helmand Province are considered insecure and nonpermissive, water sector work will involve ISAF forces to some degree. The northern and eastern regions of Afghanistan are the most studied because of easy access and relatively secure conditions for water (quantity and quality) analysts. There must be a way to measure water quantity, quality, availability, and accessibility in RC South and RC Southwest so that water in Helmand Province can be managed.

LESSONS LEARNED: WATER'S WAY FORWARD IN HELMAND PROVINCE AND COIN OPERATIONS BEYOND AFGHANISTAN

In order for water to play a part in post-conflict peacebuilding, the following lessons from experiences in Helmand Province, Afghanistan, need to be addressed:

- 1. Water cannot be managed if it cannot be measured.** Because of the paucity of available data on Helmand's surface water and groundwater resources, local and national officials lack data they need to make informed decisions

²³ Using limited available data, the U.S. Army Geospatial Center's Hydrologic Analysis Team determined that the water table in most of Helmand Province was dropping.

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about water supply and quality in Helmand Province. Scientific and authoritative stream-gauging stations and groundwater-observation wells are needed to determine the supply and quality of water in the watershed. These “authoritative” data must be complemented by “nonauthoritative,” community-collected water information to gain a rich contextual understanding of water’s relationship to security, stability, and peacebuilding in the region (Nicholson, Ryan, and Hodgkin 2002).

2. **Focus on water complexities rather than water resource management is required.** Water resource management is most often associated with infrastructure development. Though infrastructure development is linked to agricultural development and is critical to post-conflict peacebuilding, it misses the water quality, availability, and accessibility aspects of water complexities–resource management. Social-impact assessment is as consequential as water-resource assessment. A conflict-sensitive approach to analysis of water complexities in the post-conflict context can give insight into a region’s environmental security and stability and can enhance options for using water management as a peacebuilding and reconstruction tool.
3. **Water’s spatial and temporal aspects must be considered when accounting for water complexities.** From the local community level to national ministers and from weeks to years, the spatial and temporal circumstances of water-sector concerns must be considered.
4. **Data sharing is critical to post-conflict peacebuilding.** Data need to be collected and shared at the lowest level of security classification possible. The unclassified level best facilitates collaboration among all coalition forces and Afghan ministries, as well as local communities (Batson 2008). Data sharing continues to be problematic. If this is not resolved, data collection is of little use.
5. **There will be participation and support of local populations when water sector projects have a local face.** Community-focused and Afghan-led water-complexity projects need to have meaningful and active participation and support from the local population and will need to produce results quickly if local leaders are to maintain credibility in their communities. ISAF and international NGO counterparts should work in the background.
6. **The Helmand PRT civilian-military and USAID water sector projects and programs can be the seeds of a provincial public works department.** According to the U.S. Department of Defense’s field manual on COIN operations, “Essential services provide those things needed to sustain life. Examples of these essential needs are food, water, clothing, shelter, and medical treatment. Stabilizing a population requires meeting these needs. People pursue essential needs until they are met, at any cost and from any source. People support the source that meets their needs. If it is an insurgent source, the population is likely to support the insurgency. . . . If the HN [host nation] government provides reliable essential services, the population is more likely to support it” (U.S. DOD 2009, II:7, VIII:11). If the goal of the PRT is to

support the GOIRA and if one of the obligations of the GOIRA is to provide essential services to the Afghan people, establishment of public works in Helmand Province would help sway people to support the GOIRA. Water-treatment and water-quality testing are needed to support public health (Berkley 2010; Bonventre 2010). Water-sector projects and programs can tie together goals of the Ministry of Rural Rehabilitation and Development/National Area-Based Development Programme; the Ministry of Energy and Water; and the Ministry of Agriculture, Irrigation, and Livestock to bring essential services to the population. The Afghan National Development Strategy, 2010–2013 indicates that movement in this direction is underway (GOIRA 2010).

7. Near-term water projects are at risk as the civilian-military command cycles. Empirical research is needed to develop recommended courses of action for commanders and staff directors to consider when engaging the Afghan population and identifying points of friction and opportunities for collaboration and support. Change of command—from the regional military and civilian leaders to the provincial and district teams—often causes lack of continuity in water sector and public-works projects because not all commanders understand or have time to consider water’s importance. Though critical to post-conflict peacebuilding, water is seldom appreciated for the game changer it can be in the Hold and early Build phases of COIN operations. An understanding of water’s significance in COIN operations can be garnered by predeployment training of civilian and military leaders for the command and control levels, as well as by development of tactics, techniques, and procedures for soldiers, marines, and civilians who will participate in civilian-military operations.

8. Military involvement in water is an indication of a paradigm shift at the U.S. Department of Defense. Afghanistan may represent the new norm: militaries and their contractors may increasingly undertake work once delegated to humanitarians. Though COIN doctrine’s population-centric goals and objectives demand attention to humanitarian issues, the military is taking the lead at the Hold and early Build phases of actions, and then transitioning operations to the civilian agency (USAID) and its NGO contractors.

Implementation of TCAPF by the U.S. Marine Civil Affairs Group in Helmand had less than the hoped-for results (Montgomery 2010). In order to consider water’s role in environmental security and regional stability, Civil Affairs and PRTs need to be not only well trained in the use of TCAPF but also familiar with water supply and quality issues. To understand how water affects security and stability, those administering the survey and those analyzing the results need to be able to weave in the sociocultural aspects and transaction costs of water availability and accessibility.

9. Climate change and the need for adaptive mechanisms must be addressed as water complexities are analyzed. There is a need for improved adaptive practices to confront increasing variability of the water supply resulting from climate change. USAID and U.S. Department of Agriculture–sponsored

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agriculture programs in Afghanistan—programs that depend on water—are not required to incorporate a plan for climate change. Is the recurring drought in southwestern Afghanistan no longer a weather anomaly but the new normal? If so, groundwater levels will continue to drop as recharge of the system continues to fall behind demand. As crops other than poppy are encouraged, as infrastructure for irrigation is repaired and expanded, as more and more wells are dug, adaptive practices for water conservation and use reduction must be implemented (UN 2010; USAID n.d.).

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