Sustainability and National Security

Jim Hartman, Ph.D.

> "Having deployed over one million men and women in support of this Nation's longest ever fought war with an All-Volunteer Force, the Army is stressed. With an eye toward rebalancing the Force, sustainability has proven an effective tool for meeting operational requirements, while sustaining facilities and ranges, improving quality of life and reducing the burden on the natural and manmade systems on which we depend. Army leadership has also come to understand the potential for sustainability to strengthen national security (McHugh 2010)."

Introduction

The U.S. Army organizationally embraced the paradigm of sustainability over six years ago as the seeds of sustainability were sown by pioneer installations such as Fort Bragg and Fort Lewis at the onset of the new century. Today, the Army continues to apply sustainable practices and principles while driving innovative technologies to enhance mission capabilities. This paper examines the evolution of the Army sustainability program, and how sustainability is contributing to national security strategic objectives. Global demographic and natural resource trends are not only disturbing but now pose a threat to U.S. national security, prosperity, and the American way of life. A growing world population coupled with resource imbalance and global climate change will continue to fuel aggression against the U.S. as well as present governance challenges to weak nations important to global stability. Competition for scarce resources is clearly being addressed by U.S. national strategists.

They continue to contemplate how to enable long-term national economic growth and posture the nation to reduce its dependency on foreign imports such as oil from volatile regions, further undermining U.S. policy objectives. U.S. National strategists monitor China's military buildup fueled by near double digit economic growth that is highly dependent upon a vast stream of resource imports. They are also witnessing a growing wave of political unrest around the globe centered on autocratic nation states unable to provide their citizens with a stable food supply or offer any hope of prosperity. Climate change is exacerbating food shortages – each Celsius degree increase in global temperature has been postulated to reduce global grain yields by approximately ten percent (Brown 2011). The availability and management of water now appears to be the limiting factor on global food production. Water tables are falling on every continent and over the next twenty years the United Nations estimates that three billion people could face water scarcity while in the same time period water for agriculture needs to increase 60% to feed an additional two billion people (Glenn et al. 2010). The U.S. is not immune to resource scarcity and environmental degradation. Sustainability through a holistic approach focuses on resource optimization for long term availability and provides a platform for multi-state cooperation on trans-national resource issues. As stated recently by Admiral Mike Mullen, Chairman of the Joint Chiefs of Staff, "We must recognize that security means more than defense …until we restore a sense of hope in challenged regions, we will see again and again that security without prosperity is ultimately unsustainable" (Mullen 2011). Sustained or long-term economic growth requires that human capital and natural resources be prudently managed.

The Concept of Sustainability

Sustainable development or its shorthand version sustainability was rooted with the 1972 United Nations Conference on the Human Environment which debated which was more important: environmental protection or human development. The debates at Stockholm gave birth to the notion that both environmental protection and economic development were inextricably linked. That idea was refined through extensive discussions in United Nations circles over the many years that followed (Blackburn 2007).

In 1987 the Brundtland Commission, a group appointed by the United Nations to propose strategies for improving human well-being without threatening the environment published its report containing the definition of sustainability most widely used today: Development that meets the need of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987)

In 1997, John Elkington, introduced a definitional term drawn from financial accounting: the triple bottom line (TBL). By this he meant that to reach sustainability, one must achieve not only economic "bottom-line" performance but environmental and social performance as well. The TBL of economic performance, environmental quality, and social justice was an approach of preserving capitalism while addressing the global decline in natural resources and an emerging middle class in developing countries.

The concept of sustainable development led to the first Earth Summit – the U.N. Conference on Environment and Economic Development (Rio de Janeiro

1992), and to Agenda 21 – a blueprint or global action plan for sustainable development in the 21st century that included 27 principles to guide that effort. The United Nation Commission on Sustainable Development (CSD) was established by the UN General Assembly in December 1992 to ensure effective follow up of the Earth Summit.

The momentum of the Rio Earth Summit was maintained nationally through Executive Order 12852, establishing the President's Council on Sustainable Development (PCSD), which existed for six years between June 1993 and June 1999. The PCSD was chartered to:

- develop and recommend a national sustainable development strategy that would foster economic vitality
- advise the President on domestic implementation of policy options to reduce greenhouse gas emissions without debating the science of global warming
- advise the President on policies and approaches that promote "sustainable communities"
- advise the President on policies that foster U.S. leadership in sustainable development internationally

Subsequent international conferences, including the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, have reaffirmed the concept and commitment to sustainable development. The focus of the WSSD was on implementation of the Earth Summit agreements that were addressed in the Johannesburg Plan of Implementation (JPOI) which included targets and timelines to achieve specific results by stated dates. Some of these targets and timetables reaffirm commitments that

were previously agreed to in the U.N. General Assembly's *Millennium Declaration* in 2000.

In the broadest sense, sustainability can be viewed as the ability of man to live within the natural carrying capacity of planet earth. Otherwise stated, sustainability is a systems-level phenomenon based on the balance of human activities and the earth's natural processes. Unsustainable practices worldwide are increasingly leading to adversely changing conditions in meteorology, potable water availability, sea levels, crop and fish yields, disease rates, and species survival rates. The aforementioned conditions have an aggregate effect of destabilizing weak nations. In essence, unsustainable principles and practices are a threat multiplier. The United Nations Office for the Coordination of Humanitarian Affairs and the Internal Displacement Monitoring Center estimated in 2008, climate-related calamities drove 20 million people from their home – more than four times the number displaced by violent conflict (Sherbinin et al 2011). Additionally, large reinsurance companies estimate the annual economic loss due to climate change could reach $300 billion per year within a decade (Glen et al 2010).

From a corporate standpoint, sustainability is a management approach that is systems based with focus on the optimum use of resources (human and natural) while being socially responsible. Social responsibility is heavily tied to the ethics base of an organization and the organization's branding. A healthy productive work force and community are pivotal to a successful organization as is its reputation. The pricing of commercial goods is further influenced by a corporation's reputation and brand. In a world where the price gaps between similar items are continually shrinking, the corporate brand can be the decisive

factor in consumer selection and purchasing. It follows then that branding heavily influences pricing, market value and market shares. The market value of a corporation and its ability to borrow money stimulate corporate growth. Corporate America has found sustainability to be an effective business model producing dividends. As stated by Dr. Alan Hecht "The business world now clearly sees sustainability as a means to reduce long-term risk, enhance competitiveness, and to reduce cost. Furthermore, government policy now sees sustainability as essential to both domestic well-being and international security. Current environmental, economic and social pressures are challenging businesses and federal and state agencies to determine how to make sustainability operational (Hecht 2010)".

Sustainability connects the Army's activities today to those of tomorrow with sound business and environmental practices. Many of the sustainable practices the Army is currently using and seeks to institutionalize are modeled by a growing number of corporations that aim for continual improvement and ultimately long term success. Mission accomplishment is the true determinant of military success or failure. Sustainability then can be viewed as simply a mission enabler allowing the military to: enhance readiness; maximize operational capability; reduce total life cycle costs of Army systems, material, facilities, and operations; enhance the quality of life of soldiers, their families, and the community; and, be a model citizen.

In an Army context sustainability refers to sustainable operations, installations, systems and communities all enabling the Army mission (Office of the Assistant Secretary of the Army for Installations and Environment 2004).

The Sustainability Nexus to U.S. National Security

Natural resources serve as a vital component of economic development, and they are closely intertwined with political stability and security of nation states. Recognizing that national prosperity is heavily tied to a sustainable natural resource base and that a growing competition for key resources (such as fossil fuels and rare earth minerals) along with the impact of climate change can pose national vulnerabilities and stimulate global conflict, the highest level of U.S. policy now addresses sustainability. The principal U.S. strategic documents, overviewed in this section, promote a more holistic understanding of security. The national security framework is essentially transitioning from the legacy model of containment, deterrence, and control towards a sustainability based strategy. A recent white paper on a new national strategy narrative developed by aides of Admiral Mullen outlines a blueprint for this transition – focusing on three sustainable investment priorities: human capital, sustainable security, and natural resources (Mr. Y 2011). The emphasis on human capital is squarely on a refocus on education, health, and social infrastructure. Sustainable security relies on the use of a more holistic, whole-of-government approach to security; essentially expanding the roles of civil agencies and promoting stability as much as ensuring defense. While an investment in long-range sustainable management of natural resources is called upon to meet the expanding global demand for resources triggered by population growth coupled with and increasing per capita consumption of resources as a result of global development.

The 2010 National Security Strategy (NSS) emphasizes America's commitment to retaining its global leadership role and a need for America to employ an adaptive blend of diplomacy, defense, and development to advance our national interests – security of the U.S. and its allies; a strong U.S. economy; respect for universal values; and, the ability to meet global challenges. Our Armed Forces and American innovation serve as foundations of American power. The NSS lists the following as the challenges of our times: countering violent extremism and insurgency; stopping the spread of nuclear weapons and securing nuclear materials; combating a changing climate and sustaining global growth; helping countries feed themselves and care for their sick; resolving and preventing conflict, while also healing its wounds. The NSS also places an emphasis on the development of clean energy to power new industry, unbind us from foreign oil, and preserve our planet. Recognizing that there exists a tandem of development challenges – such as adaptation to global warming, the control of epidemic disease, and the knowledge to increase agricultural productivity – particularly in Africa, the NSS calls on the U.S. to increase multilateral efforts to transition to a low-carbon trajectory, support the resilience of the poorest nations to the effects of climate change, strengthen food security, and pursue "game changers" for development in vaccines, weather-resistant seed varieties, and green energy technologies.

The 2010 Quadrennial Defense Review (QDR) specifically recognizes that DOD must address climate change and energy because of their significance to national security and mission readiness. As stated in the 2010 QDR "Energy security for the Department means having assured access to reliable supplies of energy

and the ability to protect and deliver sufficient energy to meet operational needs. Energy efficiency can serve as a force multiplier, because it increases the range and endurance of forces in the field and can reduce the number of combat forces diverted to protect energy supply lines, which are vulnerable to both asymmetric and conventional attacks and disruptions." Climate change presents multiple challenges to military facilities and operations. In 2008, the National Intelligence Council judged that more than 30 U.S. military operations were already facing elevated levels of risk from rising sea levels. The projected opening of Arctic waters will require a reassessment of security in the region along with capabilities to include search and rescue and spill response as key fossil fuels become accessible in what many are labeling as the final frontier. Finally, the 2010 QDR points out "Assessment conducted by the intelligence community indicates that climate change could have significant geopolitical impacts around the world, contributing to poverty, environmental degradation, and the further weakening of fragile governments. Climate change will contribute to food and water scarcity, will increase the spread of disease, and may spur or exacerbate mass migration. In addition, extreme weather events may lead to increased demands for defense support to civilian authorities for humanitarian assistance or disaster response both within the United States and overseas." Whereas, diverse military challenges arise from climate change, so do opportunities. DOD environmental security initiatives with foreign militaries to enhance their capabilities of responding to natural disasters and to better adapt to climate change represent a nonthreatening way of building trust.

The 2011 Quadrennial Diplomacy & Development Review or inaugural QDDR follows in the footsteps of quadrennial reviews by DoD in taking a comprehensive look at how the U.S. Department of State and the U.S. Agency for International Development (USAID) can become more efficient, accountable and effective in advancing the interests of the American people. As Secretary Clinton has said, "To lead in this new century, we must often lead in new ways." The QDDR calls for the State Department to reorganize structurally to meet new challenges through the establishment of: an Under Secretary for Economic Growth, Energy, and the Environment to enhance agency effectiveness on these interconnected global issues; and, a new Bureau for Energy Resources to unite diplomatic and programmatic efforts on oil, natural gas, coal, electricity, renewable energy, energy governance, strategic resources, and energy poverty. The QDDR indicates that for the U.S., development is a strategic, economic, and moral imperative – as central to our foreign policy as diplomacy and defense. As such, six specific areas are the focus of development efforts: sustainable economic growth, food security, global health, climate change, democracy and governance, and humanitarian assistance. Emphasis is placed on a need for high-impact development, a shifting from aid to investment – helping host nations build sustainable systems. By doing so America is stated to be better postured to prevent fragile states from descending into chaos, spur economic growth abroad, secure investments for American business, open new markets for American goods, promote trade overseas, and create U.S. jobs. Ultimately, sustainable development helps countries become more capable of solving their own problems and sharing in solving common global problems.

The National Military Strategy (NMS) of the United States of America 2011 reaffirms that our military power is most effective when employed in support and concert with other elements of power as part of whole-of-nation approaches to foreign policy. The ongoing shifts in relative power - two rising Asian global powers and a number of emerging Middle East regional powers - and increasing interconnectedness in the international order indicate a strategic inflection point. This requires America's foreign policy to employ an adaptive blend of diplomacy, development and defense. The NMS points out that states with weak, failing, and corrupt governments will increasingly be used as a safe haven for an expanding array of non-state actors that breed conflict and endanger stability, particularly in Africa and the broader Middle East. Population growth and urbanization in the Middle-East, Africa, and South Central Asia are expected to contribute to increased water scarcity and could present governance challenges. The uncertain impact of global climate change combined with increased population centers in or near coastal areas may challenge the ability of weak or developing nations to respond to natural disasters. Energy-state relationships will intersect geopolitical concerns as state-run companies will control an increasing share of the world's hydrocarbon resources and the persistent challenge of resource scarcity may overlap with territorial disputes.

Another military strategic perspective on the U.S. future security environment is provided in the *Joint Operating Environment (JOE) 2010,* developed by the U.S. Joint Forces Command. The JOE is speculative in nature and in no way constitutes U.S. government policy. Rather, the JOE seeks to provide the Joint Force

an intellectual foundation to build on the concepts to guide future force development over the next twenty-five years. In the broadest sense, the JOE examines three questions: what future trends and disruptions are likely to affect the Joint Force over the next quarter century; how are these trends and disruptions likely to define the future context of joint operations; and, what are the implications of these trends and contexts for the Joint Force? Trends that have been selected for inclusion in the JOE are based upon three major ideas or themes. The first of these is how a trend might enhance or erode the power of a specific state? The second is how a trend might enhance or erode the power of the overall state system of relations relative to non-state actors? The third is how trends contribute to the emergence or suppression of global networks or ideologies that transcend the international system as we currently perceive it. The JOE delineates the following trends as influencing the world's security: demographics; globalization; economics; energy; food; water; climate change and natural resources; pandemics; cyber technology; and, space.

As per recent U.S. Intelligence Community assessments of threats to U.S. national security, delivered to Congress by the Director of National Intelligence in February 2011, the U.S. no longer faces one dominant threat but rather numerous potential threats to national security. While terrorism, proliferation of weapons of mass destruction (WMD), and the wide spectrum of intelligence threats (i.e., espionage, cyber intrusions, organized crime and the unauthorized disclosure of sensitive and classified U.S. documents) remain at the forefront, the DNI recognizes the ever expanding nature of national security threats by detailing challenges to global energy security and fresh water scarcity.

The uncertainty of future crude oil production levels to meet expected demand growth, especially in China and other large emerging market economies, translates to a continuing threat of a return of heightened price volatility throughout the remainder of the decade according to the DNI. With more than 260 river basins being shared by two or more countries, the increased pressure generated by growing populations, urbanization, economic development, and climate change on shared water resources could increase competition and exacerbate existing tensions over these resources. In the absence of mitigating action, fresh water scarcity at local levels will have wide-ranging implications for U.S. national security. This scarcity will aggravate existing problems – such as poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions – and thereby threaten state or regional stability. A whole-of-government approach, using the best modeling expertise, will be needed to assess the impact of water and other resource scarcity on state stability.

The impact of resource scarcity on national security – particularly energy, water and food - along with climate change has further become a focus area of the US CNA Corporation, involving a Military Advisory Board of distinguished retired generals and admirals. CNA has released two reports, each the result of a yearlong study, outlining the multifaceted nature of the national security threats posed by climate change and by the energy posture of the United States. Included within these reports are specific recommendations to reduce America's vulnerabilities and bolster national security. Conditions created by climate change – drought, flooding, extreme weather events of the magnitude of Hurricane Katrina, loss of coastal re-

gions, reduced water supplies, decreased agricultural productivity, crop failures, and pandemics – have the potential according to CNA to cause: multiple chronic, destabilizing conditions to occur globally. These events threaten the legitimacy of many governments in Asia, Africa, and Middle East causing protracted conflicts over dwindling resources. This may spur mass migrations causing political instability and the possibility of fueling terrorist activities. This may require a growing need for U.S. military missions ranging from humanitarian assistance, to peacekeeping, to the need to respond to conflicts over resources in regions critical to U.S. national security. CNA views America's dependence on fossil fuels as a threat to the U.S. military, diplomatic mission and economy. CNA states that the military dependence on, and inefficient use of oil, reduces mission effectiveness, puts U.S. troops in harm's way, and extracts a heavy price – in lives, resources, and dollars. Dependence on oil is further stated to hamper foreign policy decision and reduce America's leverage internationally. In 2008, the U.S. spent an estimated $386 billion on foreign oil. This massive transfer of wealth to other nations – some of which wish to harm us – often puts the U.S. in the position of funding both sides of conflicts and undercuts the global fight on terror.

The U.S. Army Sustainability Paradigm Shift

The Army is a large and complex organization with soldiers in nearly 80 countries and stewards of over 14 million acres of land. The Army's organizational structure consists of two independent pieces: the war fighting or operational Army; and, the institutional Army that supports the operational forces by provid-

ing training, facilities, and equipment to prepare and sustain soldiers. The Army relies on two basic types of facilities to conduct its mission – installations and forward operating bases (FOBs). Installations are the platforms from which the Army rapidly mobilizes and deploys military power, training the force and reconstituting it upon return from deployment, and sustaining military families. FOBs support expeditionary or contingency operations and are critical to U.S. troop surges and extended operations in multiple theatres but particularly now in the U.S. Central Command (CENTCOM). Although FOBs are vital in waging asymmetric warfare, building and sustaining FOBs in remote areas necessitate huge expenditures of resources and they have become the focus of a significant logistical effort that is vulnerable to enemy attack. The Army's logistical tail is a handicap. In fiscal year 2010 the Army's fuel costs topped $2.7 billion, seventy percent of which was for theater operations. In Afghanistan, the military is enduring one casualty for every 24 ground resupply convoys; seventy to eighty percent of the resupply weight for those logistical convoys is composed of fuel and water (Bohannon 2011).

Increasing environmental pressures – such as extended regional droughts and proposed regional nonattainment designations for air quality – along with restrictions to military training evolving from a high density build up outside key Army installations and the loss of critical buffer space was the genesis of the Army's sustainability program. This phenomenon hit a tipping point for the Army at Fort Bragg in the 1990's where the continued existence of realistic Army training was jeopardized by the preservation of critical habitat for an endangered woodpecker species. The 160,000 plus acre installation lies within six counties

in the Sandhills of North Carolina, and is the home of airborne and special operations forces. In 2001, Fort Bragg initiated a consensus-based effort with the local community that developed a twenty-five year installation goal centric sustainability plan and further resulted in the creation & implementation of Sustainable Sandhills, a regional sustainability program that is home to over 250,000 people in North Carolina - including active and retired military personnel and their dependents along with a civilian work force. From compatible land use planning, to food waste studies, to affirmative procurement, to reducing energy and water demand, to renewable energy sources, to alternative fuel and alternative fuel vehicles, to Leadership in Energy and Environmental Design certified buildings, teams associated with Sustainable Community goals are actively moving forward at Fort Bragg. Following the success at Fort Bragg, as of 2008, integrated strategic and sustainability planning (ISSP) has spread to now 21 Army installations that have undergone an ISSP process (Office of the Assistant Secretary of the Army for Installations and Environment 2010).

In October 2004, riding the success of Sustainable Fort Bragg and using it as a blueprint, the Army released its hallmark sustainability document, *The Army Strategy for the Environment,* which represented a paradigm shift for the Army moving it from a program that was predominantly compliance based to a program based on sustainable principles and practices. According to the strategy, the Army's environmental mission is to "sustain the environment to enable the Army mission and secure the future", or more succinctly, "sustain the mission, secure the future". The vision articulated in the strategy, "sustainable operations, installations, systems, and communities en-

abling the Army mission" provides a useful approach for thinking about the environment that recognizes "the interdependence between our mission, the community, and the environment." To achieve its vision, the new strategy advances six goals: foster a sustainability ethic; strengthen Army operations; meet test, training, and mission requirements; minimize impacts and total ownership costs; enhance well-being; and, drive innovation. The Army strategy is not prescriptive. The execution document or roadmap for implementation of the *Army Strategy for the Environment* is the *Army Sustainability Campaign Plan (ASCP)* published in May 2010. The *ASCP* serves to integrate sustainability efforts across Lines of Operation (materiel, readiness, human capital, and services and infrastructure) consistent with the Army enterprise architecture; it assigns responsible organizations for accomplishing overall strategic goals and objectives, and directs those strategic tasks necessary to implement the plan. The Army has listed four tenets of sustainability within the *ASCP*:

- Developing, producing, fielding, and sustaining materiel that is more energy efficient, is capable of using renewable energy resources, minimizes the uses of hazardous materials, and generates less waste.
- Ensuring the Army has sufficient access to training and testing resources, and incorporating sustainability into operational planning and execution, so the Army can continue to effectively train today and in perpetuity.
- Expanding Army commitment to sustainability by instilling sustainable practices into all levels of Soldier and Civilian education programs.

- Providing services and operating facilities in a matter that reduces consumption of energy, water, and other resources, promotes the use of renewable energy sources, enhances quality of life, and continues to protect the environment.

The Army uses the Global Reporting Initiative (GRI) guidelines for sustainability reporting and was the first U.S. government agency to do so. Army Sustainability Reports were released in 2008 and 2010.

The Army is further now incorporating sustainability into the operating procedures for forward-deployed forces under a program called *Green Warrior; Green Warrior* reduces the Army's logistics tail, enhances soldier safety and improves efficiency at base camps, and ultimately results in a more stable and sustainable country upon re-deployment. Building sustainable capacity in Afghanistan is being demonstrated by Agribusiness Development Teams led by the Army National Guard. ANG soldiers from farm belt states are teaching Afghanis modern livestock and farming techniques. Whereas the UNEP has been laying the foundations for sustainable development in Afghanistan its efforts have been limited largely to the capital city of Kabul because of security reasons. The Army through *Green Warrior* and the Agribusiness Development Teams are driving sustainable practices throughout Afghanistan including contentious areas.

Additionally, Army Combatant Commands such as the U.S. Southern Command have embraced sustainability. At an *Army Sustainability & Environmental Security Roundtable* conducted at the USAWC in November 2010, Colonel Norberto Cintron, Command Engineer, United States Southern Command, described to roundtable participants SOUTHCOM's use of environmental security and disaster prepared-

ness efforts as part of a well developed Security Cooperation Program to build capacity and create lasting defense security cooperation between South American, Central American and Caribbean states, and the United States. Colonel Cintron emphasized that climate change is now a compelling environmental security issue that threatens stability within the South and Central Americas, and the Caribbean largely through the decreasing availability of a safe water supply. Disturbing trends in the loss of key glaciers in South America to rising temperatures, the rapid urbanization in Latin America and the Caribbean where over 70% of the population is now urban, and the widening disparity in incomes between social classes were highlighted by Colonel Cintron as significant threats to both sustainability and regional security. Colonel Cintron quoted Thomas Friedman (NY Times columnist and Pulitzer Prize winning author) in saying "If we've learned anything from September 11, it is that if you don't visit a bad neighborhood, it will visit you." He further added that SOUTHCOM has touched all 32 countries within its area of responsibility over the past year to emphasize environmental security and sustainable communities through a series of capacity building venues of which many were focused on climate change adaptation. Sustainability is definitely focusing military planners at taking a long term systematic view that balances vital natural resources (such as water, fertile soil, fuel and food sources, and material inputs for industry) with economic resources, and the needs of both military and surrounding communities.

The Army has also launched a net zero effort as a cornerstone to support sustainable practices at Army installations. Net zero installations are to consume as much energy or water as they produce and eliminate solid waste to landfills. The Army's Net Zero Instal-

lation Strategy: applies a holistic approach founded on five interrelated steps – reduction, re-purposing, recycling and composting, energy recovery, and the last resort of disposal – that are linked through a hierarchy. This includes six net zero pilot installations in each of the energy, water and waste categories along with two integrated installations (Fort Bliss, Texas, and Fort Carson, Colorado) covering all three categories that are striving towards net zero by 2020; and identifies adding another 25 installations in each category in fiscal year 2014. The Army fully intends on leveraging installation net zero accomplishments into contingency base operations. Lowering emissions – heat, light, noise, and waste – will reduce the operational signature and logistics support tail.

Summary

The world has changed significantly over the past fifty years and the pace of change in the past decades is unmatched in history. The impact of man on natural resources and systems, the speed and breadth of information transfer, the interconductivity of state-government economies, and the ability of small groups to wage asymmetric warfare or lead pro-democratic movements clearly demonstrate that we no longer live in a closed system where man can control his own destiny largely through brute force, technology, and unilateral actions/decision making. As stated by Admiral Mullen, "Frankly, in this small, flatter, and faster world, I think any nation that believes it can, in a very clinical way, control events does so at their own peril" (Mullen 2011). What we do know is that the status quo will no longer work and guarantee U.S. prosperity and security. Furthermore, those societies

that have hung onto outdated value systems and beliefs throughout history in many cases have collapsed largely by failing to recognize their conductivity to natural systems and through poor decision making of leadership groups (Diamond, 2005). America must take the long-term view, applying both policy and practices that effectively balance security, prosperity, environmental and societal requirements. An alternate management approach that looks at the interconnection of all the component parts, works in harmony with natural systems that highly successful technologies mimic, optimizes human and natural resources, and leverages diversity is sustainability. The future Army will need enhanced capabilities with a smaller logistical footprint and lower resource consumption rates to sustain a wide range of operations in diverse locations (Association of the United States Army 2011). America's military has embraced sustainability and because of its scale – the U.S. Army alone is comparable to a major corporation in terms of funding, assets and global reach (only large U.S. oil companies and Wal-Mart exceeded its revenue stream in 2009) – it could become an agent of change for governance institutions and the country. As Thomas Friedman has stated "Pay attention: when the U.S. Army desegregated, the country really desegregated; when the Army goes green, the country could really go green; green is the new red, white and blue".

Conclusion

America and its military has been the model of excellence for over the last two hundred years. The core competencies of this great nation have been its education system, military readiness, and superior

technology. These competencies have been enabled by an abundance of natural resources and the spirit of the American people. Change is in the air and necessary to ensure America's security and prosperity. The military and in particular the U.S. Army has adopted the multi-dimensional approach of sustainability – balancing the needs of its mission with the environment, surrounding communities, and resource stream – to ensure Soldiers of the future have the resources they need to train, a healthy environment in which to live, and the support of local communities and the American people.

The Army has a solid foundation for its sustainability paradigm shift with an overarching strategy, senior leadership support, and a campaign plan to change the Army culture. Army behavioral change shaped by education, policies and doctrine is and will continue to stimulate resource conservation, the repurposing of materials, and improved efficiencies. Behavioral change within the Army starts as early as boot camp, and within academia for new cadets. Future senior leaders and current senior leaders will be exposed to the concepts of sustainability through diverse educational opportunities including: the core curriculum of the U.S. Military Academy; U.S. Army War College student research papers, fellow papers, and electives; virtual training leading to accredited degrees such as offered by the Arizona State University School of Sustainability and the Warner College of Natural Resources (WCNR) and Continuing Education at Colorado State University ; and, various orientation courses for new commanders.

The Army will develop sustainable facilities and equipment through leadership, doctrine, innovative research and development, diverse partnerships, and

sustainable practices promoted through its net zero initiative. A coordinated effort across federal agencies can further serve to break down traditional silos to further advance and support a potential convergence of sustainability by business and government (Hecht, 2010). The Army because of its scale has a role in stimulating the markets for sustainable based products and technology through its procurement policies and practices. The full support of government and industry partners is essential for the development and integration of sustainable technologies, processes and practices – the Army cannot do it alone (Association of the United States Army, 2007).

As stated by the Honorable Ms. Katherine Hammack, the Assistant Secretary of the Army for Installations, Energy and Environment, "Through innovation, adaptation, exploration and evaluation, we are creating a culture that recognizes the value of sustainability measured not just in terms of financial benefits, but benefits to maintaining mission capabilities, quality of life, relationships with local communities and the preservation of options for the Army's future" (Bohannon 2011).

The challenges of the future require the military and its leaders to possess agility to ultimately be successful. This agility is the product of rigorous education, appropriate application of technology, and a rich understanding of the social and political context in which military operations are conducted (The Joint Operations Environment 2010). Sustainability and the systems approach it applies serve as an enabler of military operational agility. In the final analysis, sustainability is simply about being better today and in the future by applying a systems-thinking approach with a focus on resource optimization. It is about be-

ing better through the enhancement of mission capabilities while reducing both financial burden and risk.

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