

**ENVIRONMENTAL THREATS TO
SECURITY, STABILITY, AND U.S.
INTERESTS IN SOUTHERN AFRICA:
Opportunity Knocks – Time for a
Comprehensive Region Defense Environmental
International Cooperation and Environmental
Security Assistance Strategy**

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Environmental Threats to Security, Stability, and U.S. Interests in Southern Africa:

Opportunity Knocks – Time for a Comprehensive Region Defense Environmental International Cooperation and Environmental Security Assistance Strategy*

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Significant strides have been made in much of southern Africa in terms of economic development, conflict resolution, and political development and democratization. ‘Traditional’ security challenges in the region are largely on the wane but, environmental trends and stresses which significantly threaten human security and state stability in the region could slow or undermine the area’s progress.

Environmental security threats in the region overlap with U.S. regional and global security interests including: *terrorism and violent extremism, epidemic and pandemic disease, climate change, and transnational organized crime*. An organizing strategic construct, agreeable to regional countries, around which security cooperation can be conceptualized and military to military relations build has been lacking. Environmental security provides such a rubric and offers tremendous opportunities for the United States and its regional partners.

Defense Environmental International Cooperation (DEIC) and other environmental related security assistance can significantly enhance regional security and further U.S. regional strategic ends. The U.S. Department of Defense (DoD) and U.S Africa Command (AFRICOM) should devise, implement, and fund a regional DEIC and environmental security assistance strategy that integrates with and *supports* broader U.S., regional, and international environmental efforts.

Such as strategy should be centered upon three pillars:

1. Geography (anchor state and ink spot approach)
2. Environmental Crime and Humanitarian Assistance/Disaster Relief (HADR)
3. Sustainability

Introduction

Southern Africa is a critical and strategically important region to the U.S. However, southern Africa¹ is at a crossroads. Significant strides have been made in much of the region in terms of economic and political development, governance, and security. The region (as a whole as well as individual countries such as Botswana) is frequently held up as an example of good news and hope from a continent usually portrayed as the world’s most benighted. Nevertheless southern Africa still faces formidable challenges including water scarcity, loss of biodiversity, land degradation, environmental crime, natural disasters, and climate change that could undermine, if not reverse, future progress, stability, and security.

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Such environmental challenges threaten U.S. and southern African goals and interests for the region such as peace and stability, food security, and sustainable economic development.

Because environmental security issues lie at the intersection between ‘human’ and ‘traditional’ security, promoting environmental security offers significant potential for building and sustaining regional security and stability on fronts where U.S. and African interests converge. Defense Environmental International Cooperation (DEIC) and environmental security assistance are important means through which these ends can be pursued. Furthermore, southern African governments have publically committed themselves to environmental stewardship and regional cooperation while civil society has a relatively vigorous environmentalist component (Henk 2006a, 110).² U.S. government environmental aid programs (State Department, USAID, etc.) in the region are also well developed and fairly robust. Thus there is forward momentum and a foundation of success upon which effective environmental security activities can be built.

A concerted DEIC and environmental security cooperation strategy could help buffer the region against looming environmental challenges thereby enhancing regional (and by extension continental) security while protecting and advancing the progress being made on various fronts related directly to stated U.S. and AFRICOM strategic goals and priorities including: confronting transnational security threats (including organized crime, narcotics trafficking, and violent extremism); promoting peace, stability, and economic development; conflict prevention; respect for rule of law, civilian control over the military and security sector reform. DEIC offers an approach whereby U.S. and African interests can be mutually addressed in turn generating win-win situations and building needed confidence and trust in the security sector.

The potential and precedence for this has been already established in the promising but limited and stillborn DEIC and environmental security activities conducted during the late 1980’s into the early 21st century including: military to military cooperation on biodiversity protection and anti-poaching with Botswana and Namibia, demining with Namibia, and military environmental management with South Africa.³ Despite some on-going good work by Offices of Defense Cooperation and Security Assistance Offices as well as the small community of DoD and AFRICOM environmental security specialists, the strategic potential of environmental security assistance and DEIC will not be realized unless a systematic, comprehensive approach is developed, resourced, and sustained. Therefore, it is high-time that a comprehensive and robust regional DEIC and environmental security strategy be crafted and implemented.

Such a strategy should focus on three areas (the rationale for which will be discussed in detail later): sustainability, humanitarian assistance/disaster response (HADR), and environmental crime with the correlating objectives of supporting and enhancing broader international, regional, national, and U.S.

environmental and sustainable development programs; increasing southern African capacity to mitigate and respond to environmental crises; and promoting security and stability by countering environmental criminal threats.

Development of an effective regional DEIC/environmental strategy will require the following:

- conduct of a comprehensive environmental security assessment (risk, vulnerability, threats, opportunities)
- inventorying and mapping relevant existing international, regional, national, and U.S. environmental and sustainable development programs; identify gaps and areas where DEIC and environmental related security assistance may have the most impact
- conceive, coordinate, and prioritize DEIC areas and programs
- procure additional resources/funding for DEIC and environmental security
- incorporate sustainability and mechanisms for eventual local sustainment and ownership of environmental security programs

This report will begin with an overview of key environmental security challenges and their strategic importance in the region. Then opportunities and rationale for DEIC and security assistance in various areas will be discussed. The report will conclude by presenting a concept on which a regional DEIC/environmental security strategy can be developed.

Regional Environmental Security Overview

An extensive literature and debate over environment-security linkages exist which does not need to be reviewed here. For purposes of this report it is sufficient to point out that there is general (though not universal) agreement that environmental factors can produce or exacerbate security threats under certain circumstances in particular contexts. These can include: conflict and competition (sub-state or interstate) over access and control of valuable natural resources; human insecurity and political instability caused (or intensified by) the inability of socioeconomic and cultural systems to cope with degrading renewable resource systems, ecosystem changes, natural disasters, or (re)emerging infectious diseases; environmental crime (and potential use of such crimes as funding sources by terrorists or insurgents). Equally importantly, historical and contemporary evidence suggests societies and states also cooperate in the face of environmental challenges. This duality presents both opportunities and challenges.

Threat and Opportunity in Southern Africa

The extent to which environmental factors may morph into security concerns is a function of physical and human variables including the vulnerability and resilience of both natural and human

systems to various stresses and impacts. In this sense, significant opportunities and dangers are present in southern Africa. Observers generally agree the region is a bright spot in terms of recent political and economic development as well in terms of environmental activity and awareness amongst international and local civil society and national governments. However, the region faces formidable environmental challenges while the capacity and political will to surmount them is still insufficient or of uncertain depth. Consequently, significant opportunity exists to further promote and spread security and stability via environmental security means while simultaneously preventing future insecurity and instability.

Southern African countries' Environmental Sustainability Index⁴ scores illustrate the region's straddling position between environmental promise and vulnerability. Southern African states show a mix of low to moderate environmental stresses, above average to high levels of environmental stewardship (regional and international environmental assistance and cooperation) and institutional concern, but medium to high levels of vulnerability and moderate to low levels of capacity.⁵ The average ESI score for the region is 48.6; slightly higher than the 46.4 average for all NEPAD countries.⁶ For example, the region has made significant strides in trans-border environmental cooperation with nearly 20 Trans-frontier Conservation Areas (TFCA) in existence or on the drawing board, the establishment of the Okavango Permanent River Basin Commission (OKACOM), and the proposed (and highly ambitious) Kavango-Zambezi (KAZA) TFCA project. However, as of 2008 the future of KAZA was not guaranteed.⁷ OKACOM has been lauded as a model for international environmental cooperation and river basin management. Yet it has taken 14 years for a secretariat to be created while sustained political will has been uncertain.⁸ As interstate water cooperation ploddingly develops, southern Africa continues to suffer from "second order water scarcity" (the "lack of social and political adaptive capacity to manage water successfully to the satisfaction of all stakeholders").⁹ The 2000 Mozambique floods, for instance, originated in cross-border shared basins where poor disaster risk reduction strategies regarding dam design and management and poor communications networks were at play.¹⁰ Likewise in terms of combating illegal, unregulated and unreported fishing (IUU) SADC members have made significant strides in monitoring, control and surveillance (MCS) and have agreed to prepare a *SADC Marine Fisheries Ministerial Declaration to Stop Illegal Fishing*. However regional MCS capacity remains limited and "inadequate formal or diplomatic mechanisms or frameworks are in place between SADC states to allow for exchanges of data."¹¹

This regional environmental duality is echoed in a recent analysis of security risks related to climate change produced by the German Advisory Council on Global Change. Through an analysis of ecological, socio-economic, and demographic factors the Council identified southern Africa as a potential climate change hotspot where climate change will present major challenges.¹² The council concludes that significant vulnerabilities to environmental stresses exist but that notable economic and political progress

is also being made. Furthermore, it is uncertain whether sufficient capacity and recognition amongst governments and civil society to respond and adapt to climate change induced stresses actually exists.¹³

A similar pattern is also revealed in a Population Action International (PAI) analysis of “demographic stress” that examined the potential for an interplay of population (i.e. urbanization rates, youth bulges) and environmental factors (i.e. water scarcity, availability of cropland) to produce conflict and instability. PAI’s analysis characterizes all southern African countries, with the exceptions of Namibia and Zambia (elevated risk) and Malawi (very high risk), as being in a state of elevated risk (which basically means things could go either way).¹⁴

Natural Hazards (drought, flood, fire)

Natural disasters are a significant environmental security concern in southern Africa. According to the UN Center for Research on Epidemiology and Disasters, southern Africa suffered 73 disasters (mainly droughts and floods) between 1991 and 2005.¹⁵ The year 2005 was a particularly bad year for the region. Three countries ranked in the top 10 worldwide for victims killed or affected per 100,000 inhabitants: Malawi 37,376; Zambia 10,666; Mozambique 7,461.¹⁶ Mozambique has also been hit with serious floods in 2000, 2008, and 2008. Southern Madagascar has been afflicted by persistent drought in recent years, in 2007 the country was hit by 6 cyclones (the worst year on record), and in 2008 340,000 persons were affected by three cyclones. Five million persons in Malawi were affected by drought in 2005.¹⁷ Botswana was struck by massive wildfires in 2008 and by a series of floods between March and June of 2009, the worst since 1965.¹⁸ Both sets of disasters exceeded civilian capacities and required Botswana Defence Force (BDF) participation in multi-agency response efforts.¹⁹

Climate and Resource Issues

Freshwater Resources

Freshwater resource issues pose major obstacles to sustained economic and political development in southern Africa. Average annual rainfall for the SADC countries is 948mm; however most of the region’s area including all of Botswana, Namibia and nearly all of South Africa, Lesotho, and Zimbabwe receive less than the world average of 860mm. Namibia, Malawi and South Africa are currently considered water stressed. Botswana is classified as facing chronic scarcity. By 2025 Malawi, South Africa and Namibia are projected to face chronic scarcity while Lesotho, Swaziland, and Zimbabwe will be water stressed.²⁰ Even without climate change, the number of individual southern Africans exposed to ‘water stress’ (less than 1000 m3 of water per person per year) will grow from 3.1 million in 1995 to between 33 and 38 million by 2025.²¹

Water supply problems are compounded by issues of water quality. Freshwater is often of poor quality contributing to a range of health problems including diarrhea, intestinal worms, and trachoma.²² Thirty-five million people in the region still rely on “unimproved water sources; the largest proportion being in Mozambique, followed by Angola, South Africa, Zambia and Malawi.”²³

Southern Africa has also been hit by acute energy shortages as economic growth has outstripped energy production. The past three years have witnessed blackouts, mine shutdowns, electricity shortfalls and loss of millions of dollars in mining and industrial production.²⁴ A survey of BDF officers attending the BDF Staff College in 2009 revealed that they consider unreliability of energy a significant security concern.²⁵ Hydroelectricity will become increasingly important as the region struggles to expand energy supplies. This in turn will both complicate and increase the need for effective interstate water management regarding hydroelectric resources.

Regional water supply and quality problems will be exacerbated by climate change (see following section on climate change) which will in turn compound the previously discussed lack of social and political adaptive capacities. Freshwater issues can thus be expected to challenge food security, energy supply, economic development, social, and even political stability.

Land Issues

Unlike in semi-arid parts of northern and eastern Africa, socio-economic and cultural factors that help spur conflicts amongst and between pastoralists and farmers over access to land are less intense in southern Africa.²⁶ Land-related conflicts more frequently reflect the legacy of colonial policies that have spawned ownership and access disputes such as those between white and black farmers or like those between local communities and aboriginal hunter-gatherer groups against national and/or outside interests such as conservation, mining, and tourism

According to Botswana’s Vision 2016 Council report the potential for general land use conflicts exists between competing interests such as “large-scale farming, small-scale subsistence and traditional farming, hunting, mining, tourism, wildlife management, population growth and urbanization”.²⁷ Perhaps the most well known regional example is the aboriginal-state dispute between the San (i.e. “Bushmen”) of the Kalahari and the governments of South Africa, Namibia, and Botswana. This has pitted the San plus local and international NGOs (most notably Survival International) against national governments over issues such access/ownership of land, resettlement, basic services, political representation, mineral claims, and hunting rights. While there is little likelihood of violent rebellion in the near-term, increased protests and political action are possible.²⁸

Most present land-related disputes are localized and small in scale. In 2009, for instance, a dispute erupted between villages in the Botswana’s Nata Bird Trust Sanctuary (and potential corporate

development partners) with cattle farmers who claimed the sanctuary has encroached upon their grazing area. The Minister of Lands and Housing is currently mediating the dispute.²⁹

Land conflicts exemplify how the duality of environmental security issues in the region poses both risk and threat. On one hand, judicial systems have been proven able to peacefully adjudicate environmental disputes while³⁰, on the other, the persistence and frequency of these controversies suggests a lingering potential for environmental conflicts to undermine stability and governmental legitimacy³¹.

Terrestrial Biodiversity and Renewable Resources

Deforestation, soil erosion, other human impacts, and increasingly climatic changes are stressing biodiversity throughout the region.³² For example, satellite imagery shows the total area of natural forest in Madagascar declined from 9.4 million hectares in 1993 to 8.5 million ha in 2000.³³ Furthermore, human induced soil erosion and degradation - driven by tree cutting for firewood and charcoal production, commercial afforestation and logging, unsustainable agricultural practices, and overgrazing are serious and expanding problems in southern Africa.³⁴

The movement of refugees and internally displaced persons (IDPs) has been demonstrated to intensify soil erosion as persons “forced by their desperate positions to seek shelter and energy have removed trees.”³⁵ Thus there is a potential for future population displacement and environmental degradation to produce expanding negative vicious cycles whereby deforestation and soil erosion interact with political instability and violence plus climate change and food insecurity (see next section).

Climate change and Food Security

Ascertaining the security impacts of climate change is difficult because state and societal vulnerability and resilience to climatic shifts are functions of complex interactions between physical, cultural, economic, technological, and political variables. In the case of Africa, it is particularly problematic because of a relative dearth of regional and sub-regional scientific assessments. Nonetheless, macro-level studies and existing sub-regional research strongly suggest that climate change will pose significant challenges to southern Africa by compounding existing environmental security challenges and generating new ones such as the spread of malaria into previously unaffected areas.

Climate change poses a particular challenge for management of freshwater resources. Increased flooding, drought, increasing temperatures and desertification and could intensify water-related interstate disputes. Declining quantity and quality may compound socio-economic and development challenges particularly in regard to food security.³⁶

Significant increases in heavy rainfall events have already been observed since 1970 in Angola, Namibia, Mozambique, Malawi, and Zambia.³⁷ According to the Intergovernmental Panel on Climate Change (IPCC), approximately half of the sub-humid and semi-arid parts of the southern African region

are at moderate to high risk of desertification under various climate change scenarios³⁸ and almost all countries in southern Africa (South Africa excepted) “will probably experience a significant reduction in stream flow.”³⁹ Grain harvests are likely to fall throughout the region. By 2080 11% of the region’s arable land could be unsuitable for agriculture⁴⁰ and wheat farming could disappear completely.⁴¹

Negative impacts on animal and livestock populations from drought, heat stress and shifts in patterns and prevalence disease patterns should be anticipated under predicted conditions of climate change. An assessment of species’ sensitivity in 141 sub-Saharan national parks in sub-Saharan Africa under several climate change scenarios projects that 10-15% of mammal species could fall within the International Union for the Conservation of Nature (IUCN) critically “endangered” or “extinct” categories by 2050 with up to 40% by 2080.⁴² A Kruger National Park study furthermore estimated that, under various scenarios, 66% of parks species could be lost including Zebra.⁴³ Recent extreme weather events illustrate what climate change may portend for animal populations. Atypical sub-freezing weather killed antelope in South Africa’s Mdikwe reserve in the winter of 2008, while several years earlier, elephants in Kruger National Park succumbed to sub-freezing temperatures.⁴⁴

Such losses of animal biodiversity and livestock would have considerable negative impacts on countries and populations dependent upon livestock rearing and wildlife tourism. Cattle raiding and the effects of poaching would likely intensify as well.

Fisheries may be adversely impacted due to climatic effects on coral reefs, estuaries, and water and wind conditions. With a doubling of atmospheric CO₂, simulations show that South Africa’s fisheries could experience decreases in productivity of 50-60% from extreme wind and turbulence.⁴⁵ Climatic related impacts on infrastructure and fisheries are likely to negatively affect economic growth and development and may generate increases in maritime crimes such as piracy, sea robbery, illegal migration, and human smuggling/trafficking in coastal zones.

Climate change will almost certainly intensify disease risk and burdens in southern Africa. Multiple scenarios indicate that more of southern Africa is likely to become suitable for Malaria transmission.⁴⁶ Exposure to waterborne illness should also increase if flooding events become more frequent or intense. Floods, for instance, can trigger malaria epidemics in arid and semi-arid areas.⁴⁷ Migration has been correlated with the spread of HIV/AIDS and other diseases in southern Africa, thus climate induced migration is likely to mean increased diffusion of various infectious diseases.

Environmental Crime

Environmental crimes such as poaching, illegal and unreported (IUU) fishing, illicit logging, natural resource smuggling, and illegal dumping of wastes pose significant and direct threats to the region’s people, environment, development, and security.

Illegal Natural Resource Extraction Smuggling

Illegal extraction and smuggling of natural resources such as timber and minerals directly threaten human security, national economic development, and governance in southern Africa. Forests, for instance, provide goods and services critical for economic development and human security. These include: fuel wood, grazing, food, medicines, woodcrafts, timber, biodiversity, water catchment, soil conservation, and eco-tourism.⁴⁸ In the 11 dry-zone countries of SADC, more than 50% of households rely on wood for fuel. In 2002, the forestry sector employed 14,500 in Zimbabwe and accounted for 3% of the country's GDP, while in Swaziland forestry provided 25% of GDP.⁴⁹

Illegal and unregulated extraction and transport of gems and minerals has links to international organized crime, corruption, and undermines local economies while depriving national governments of needed revenues. Smuggled diamonds from Zimbabwe have recently been reported as far afield as in Canada.⁵⁰ Reportedly, 15 tons of gold (historically a major source of government revenue) "leak" from the country's economy each year and that over half of its annual gold output for the past seven years has been lost.⁵¹ Likewise, smuggling of gemstones such as tourmaline, garnets, and emeralds have resulted in "massive revenue losses" and hindered economic growth in Zambia.⁵²

Namibia, South Africa, Malawi, and Zambia are all uranium producers with Botswana set to join their ranks.⁵³ Zimbabwe is believed to have uranium deposits as well.⁵⁴ Yet across the region and continent, mechanisms and capacity for safe mining and preventing illicit trafficking are uneven. Africa also lacks a "regulatory framework to protect African uranium resources from being exploited by foreign companies at the expense of local communities, and to ensure that uranium does not fall into the wrong hands".⁵⁵ The on-going problems with timber and mineral smuggling from Malawi, Zambia and Zimbabwe should be reason for concern over the safety and security of uranium mining.

Improper uranium mining damages ecosystems and threatens human health causing conflicts between communities, companies, and national governments. Lack of safeguards may also pose a proliferation risk. In Malawi for example, community groups have questioned the environmental impact assessment (EIA) conducted by Paladin Energy Limited for mining in Kayalekera. One International Atomic Energy Agency (IAEA) official, in fact, has denied that the IAEA has even authorized production in Malawi.⁵⁶

Forest fires, illegal logging, and invasive alien species (along with conversion of forestland to cropland and high dependence of wood as an energy source) have been identified by the UN Food and Agricultural Organization (FAO) as the primary threats to forest resources in 11 dry-zone SADC countries.⁵⁷ For example, Zambia currently loses K80 billion in revenues to do clandestine logging and timber export, mainly conducted by Chinese and South African companies with the connivance of corrupt officials.⁵⁸

Illegal logging plus hazards like wildfires threaten human security and national economic development. Malawi has the highest deforestation rate in SADC at 2.8% per year which has adversely affected energy generation (hydro and fuel wood), winter crop production (soil erosion and loss of stream flow), and fishing.⁵⁹ Much of this is due to illegal logging for charcoal production (for domestic and transborder markets) enabled by poverty, corruption, and lack of enforcement capacity.⁶⁰

Small-scale illegal and unregulated extraction of localized natural resources is also common in the region. For example, the Botswana Department of Mines recorded 13 cases of illegal river and pit sand collection as of June 2009, 96 in 2008, and 47 in 2007.⁶¹

Illicit and unregulated resource extraction in southern Africa also poses geopolitical challenges and opportunities. “China’s increasing participation in Africa’s extractive industries suggests a new more intense struggle to control the continent’s wealth, with a possible concomitant decline in transaction transparency and best practice corporate governance.”⁶² This poses the dual threat of growing Chinese influence along with the generation of negative long-term socioeconomic, environmental, and political consequences.

However, growing environmental consciousness in southern Africa could be used by the U.S. to leverage support for environmental protection and conservation in southern Africa against Chinese missteps. A window also exists to help shape the inevitable growth in Chinese resource extraction activities along more constructive and sustainable lines that complement U.S. regional environmental and governance objectives while mitigating long-term consequences for southern Africans.⁶³

Terrestrial Poaching/Raiding

Poaching and trafficking in endangered or threatened species and products is one of the (if not the) most lucrative and violent environmental crimes in southern Africa. Profits from the global trade in illegal wildlife are estimated to be between \$5 and 20 billion annually.⁶⁴ The price of wholesale elephant ivory skyrocketed from \$100 per kilogram in the late 1990s to from \$200 to \$900 per kilogram in 2007.⁶⁵ Southern African elephants, particularly from Zambia, Zimbabwe, and Tanzania seem to be the primary targets.⁶⁶ Rhino horn can sell from \$945 to \$50,000 per kilogram.⁶⁷ Other wildlife products poached, hunted, and illicitly trafficked in southern Africa include: skins, big cats (and parts), and bush-meat (buffalo, antelope, etc.).

The illegal wildlife trade poses several environmental security challenges. These include: loss of biodiversity (which can disrupt ecosystem function and related livelihoods as well as reduce populations of economically valuable species for subsistence, tourism, hunting or other uses), introduction of alien invasive species (which may in turn degrade ecosystems and economies), criminal violence, and disease transmission (both human and animal).

Poaching and trafficking syndicates in southern Africa can be extremely violent, tied to international organized crime, outgun security forces, and include former insurgents or special operations personnel amongst their ranks. Poachers have been known to capture, kill, and torture anti-poaching personnel.⁶⁸ They also employ sophisticated and adaptive military tactics including: tracking, weapons caching, use of observation and listening posts, ambush, operational deception, and use of light aircraft from remote strips.⁶⁹

Livestock raiding (internal and transborder) also has a long history in southern Africa and remains a perennial problem. For instance between January and June 2009, the Botswana Police Service reported 20 instances in which a total of 167 livestock were smuggled into Zimbabwe from the Bobirwa area.⁷⁰

Maritime Poaching and IUU

Abalone poaching has exploded since the early 1990s. According to some estimates, illegal exports to China increased by 300% during the past five years.⁷¹ With the sustainability of abalone stocks threatened, South Africa reduced its total allowable catch (TAC) from 500 tons in 1999 to 75 tons in 2007, meaning that nearly all of the 2007 catch - estimated to be over 2000 tons - was illegally harvested.⁷² South African wildlife officials say local abalone is on the brink of extinction.⁷³ At current rates the entire Cape coast stock could be wiped out within 6 years.⁷⁴

Abalone poaching ties local actors into transnational networks with shellfish likely moving from South Africa to China and other Asian destinations sometimes via other SADC countries including Mozambique, Namibia, Swaziland, Zimbabwe, Zambia, Madagascar, and Mauritius.⁷⁵ The initial price of abalone at the first step of the chain, from harvesters to Chinese buyers, was estimated to be \$427 per kilo in 2007.⁷⁶ Some analysts estimate the trade to be worth upwards of \$200 million annually.⁷⁷

Solid data on IUU fishing in the SADC region is virtually non-existent.⁷⁸ This lack of data is in itself a serious vulnerability. From what can be pieced together, the most serious effects, in terms of direct and indirect economic and ecosystem, from IUU within SADC appear to be in the coastal shrimp and demersal reef fisheries. Social and related security impacts in this fishery include: direct conflicts between inshore industrial and artisanal fisheries, and impingement on the food security of coastal communities.⁷⁹

IUU and illegal abalone harvesting can be extremely violent. In 2003 Mozambique Marines exchanged fire with a long-line vessel fishing illegally within Bazaruto National Park. In 2004 the Indonesian MFV Sin Iu Peng attempted to resist a joint South African and Mozambican armed boarding party.⁸⁰ Violence has characterized abalone poaching from the 1994 “Abalone War”⁸¹ through the present⁸² with security personnel facing increasingly well organized and sophisticated organizations, firepower, and tactics.

Similar to terrestrial poaching, abalone poaching has taken on aspects of contemporary insurgency and irregular warfare which presents civil-security challenges. Poachers themselves often come from economically disadvantaged coastal communities. Middle-men and international traffickers come from organized street gangs and international (mainly Chinese) crime syndicates. One response being considered is to implement resource co-management schemes with local coastal communities in order to separate locals (analogous to an insurgency's support base) from organized criminals by providing economic opportunities and allaying "community alienation from the abalone resource [a result of harvesting bans]."⁸³ As in counterinsurgency, meeting the needs of the locals is insufficient unless adequate security for the population can be provided. In this case "gang operatives are readily bent on disregarding any local rules and regulations that may be put in place by the local community because of their access to instruments of violence. They may threaten any members of the community involved in policing or enforcement."⁸⁴

Convergence between Environmental Criminals and other Violent Non-State Actors

Environmental crimes in the region should not be viewed as isolated or single security threats because they are woven into wider non-state, transnational threat milieu. Local and international organized crime groups operate in southern Africa. These include: Nigerians, Chinese, Russians, Indian, Pakistanis, Colombians, Italians, Portuguese, and Moroccans.⁸⁵ Many criminal groups engage in diverse activities. Abalone smuggling, for instance, provided an entry point for Chinese organized crime to set roots in southern Africa during the early 1990s. Chinese gangs have since diversified into trafficking of poached rhino horn, ivory, shark fins, and animal skins as well as drug trafficking, money laundering, and migrant and contraband goods smuggling.⁸⁶

Portuguese groups have engaged in diamond and gold smuggling as well as truck hijacking.⁸⁷ Zambian authorities arrested a brother and sister in 2008 on charges of trafficking narcotics and illegally selling ivory.⁸⁸ While in 2009 Tanzanian police seized ivory, lion claws, turtle shell jewelry, and suspected cocaine from a woman attempting to embark on a flight to China.⁸⁹ In 2009, a ZANU-PF official known for past involvement in illegal gold trading was charged with poaching rhino horn for shipment to China.⁹⁰ Intelligence sources developed by Botswana security personnel for anti-poaching purposes have in turn yielded intelligence about other organized criminal activities.⁹¹

According to the U.S. International Narcotics Control Strategy, southern Africa provides a strategic conduit into global markets for drug traffickers.⁹² Smuggling routes for illicit and poached wildlife products share routes as used for the movement of drugs, weapons, and other illicit contraband within the region as well as across the Indian Ocean and to and from Europe and South America.⁹³ Because of the poor state of roads in the region, many western security analysts dismiss or downplay the potential for southern Africa to serve as a land conduit for illicit goods. However, the movement of rhino

horn, ivory, and abalone between southern African countries en route to either Indian Ocean ports or South African air hubs suggests well developed smuggling and trafficking routes already cross southern Africa.

Groups that specialize in particular types of crime may also become entangled with broader criminal networks as one of the main methods of laundering and moving illicit profits is through bartering illicit goods.⁹⁴ For example, by the late 1990s a multi-faceted abalone for drugs economy had emerged in South Africa's Western Cape. "Chinese organised crime bartered cheaply attained chemical precursors for valuable abalone; Western Cape drug dealers bartered cheaply acquired abalone for high value drugs; poachers exchanged abalone for drugs for resale or, alternatively, for their own consumption."⁹⁵ The Cape is now being ravaged by a 'tik' (methamphetamine) epidemic which between 2005 and 2007 resulted in a 200% increase in drug related crime - including 50 murders a day and a rape every 26 seconds.⁹⁶ Thus, in South Africa, the fight against abalone poaching needs to be tied to the fight against drugs.⁹⁷

Open source evidence of terrorist involvement in poaching (and environmental crime in general) is limited and anecdotal.⁹⁸ However, al-Qaeda and affiliated/likeminded groups have and continue to engage in diverse criminal activities for purposes of raising money and laundering/moving resources. These activities include: diamond and gem smuggling, drug (hashish, opium, heroin) trafficking, and antiquities trafficking.⁹⁹ "According to U.N. reports and Interpol officials, some insurgent groups and possibly terrorist groups are reportedly engaged in illegal poaching for profit in several areas of Asia and Africa."¹⁰⁰

Several press reports, albeit unconfirmed and anecdotal, further suggest that the possibility of such linkages should be considered. Indian authorities suspect Bangladeshi militants (some of whom may have al-Qaeda or other transnational extremist ties) of cooperating with Bangladeshi rhino and elephant poachers in order to raise revenue and move funds under the radar via the trade in poached wildlife products.¹⁰¹ East African media outlets have also reported that an individual linked to a suspected Al-Qaeda financier is connected with poaching activities conducted in part to help finance terrorist operations.¹⁰² Furthermore Moroccan, Pakistani and Indian organized crime groups are active in southern African and such groups have been known to cooperate with Islamists terrorists and militants elsewhere in the world.¹⁰³

Recent al-Qaeda threats and *jihadi* propaganda have advocated starting forest fires against the nations considered to be at war with Islam.¹⁰⁴ Although no southern African countries have been singled out as targets, the ease of setting wild-land blazes in arid and semi-arid environments might appeal to al-Qaeda sympathizers either in the form of local "lone wolves" or small self-formed cells lacking the skills and resources to conduct more conventional terrorist attacks.

Elsewhere in Africa, ivory poaching has been linked to insurgency and conflict. Sudanese and Somali armed groups have launched “ivory raids” into neighboring countries, Sudanese rebels have traded ivory for weapons, and the *Janjaweed* are suspected of cross-border poaching.¹⁰⁵ Thus even when this nexus does not pose direct threats to southern African states, it is something southern African peacekeepers may have to confront when deployed elsewhere in Africa.

Opportunities for DEIC and Environmental Security Assistance

Background and Current State

DEIC and other environmental security programs have been recognized, by several combatant commanders formerly responsible for African AORs, as highly effective but low costs means. EUCOM commander, General Craddock testified before congress that the “DEIC program is another low cost, high impact program that is reaping dividends beyond its focus area.”¹⁰⁶ Retired General Anthony Zinni credited environmental security and disaster assistance conferences as forms of engagement that benefit all sides, build relationships and capabilities, and tie important military and non-military programs together while he was CENTCOM commander.¹⁰⁷ Based upon his earlier analysis of U.S. and environmental security programs and interviews with southern African military officers, Dan Henk likewise concluded that “military to military partnerships between the United States and countries in southern Africa are a domain pregnant with possibilities.”¹⁰⁸

DEIC and environmental security assistance have great potential to promote human, national, and regional security in southern African countries, develop professional defense forces, and nurture positive civil-military relations. For example, the success of the BDF in anti-poaching is “. . . an example of an African solution to a specific security problem . . .” and more importantly how “eminently repeatable: a well-trained, well-disciplined and well-led public-sector institution can perform sterling service for a nation, and such institutions do exist in Africa.”¹⁰⁹ U.S. assistance, from 1987 to 1998 including the provision of small boats, communications equipment, and light aircraft plus training in patrolling and other skills was integral in launching the BDF’s anti-poaching mission.¹¹⁰ The U.S. also provided significant support to anti-poaching efforts in other southern African countries such as Zimbabwe during the 1990s.¹¹¹

Given the interconnectivity between environmental and security issues in southern Africa plus the growing importance of global climate change, Africa, security assistance, “soft power”, and the whole of government approaches in U.S. defense strategy along with a more environmentally inclined Presidential administration; the time appears ripe for a concerted regional DEIC strategy to be designed and implemented.

However, despite its seeming popularity and promise DEIC is lightly funded and activities are limited. Since 2001 annual funding for DEIC worldwide has generally been under \$2 million.¹¹² In southern Africa there have been 2 to 4 events (mostly small workshops) per year (costing roughly \$25,000 to \$50,000 apiece) over the past 3 years.¹¹³ Promising military to military environmental programs launched in the late 1990s had become moribund by the early 2000s.¹¹⁴ Furthermore, central coordination and integration of defense environmental efforts and other U.S. and regional environmental efforts has been lacking, as has an overarching organizing concept.¹¹⁵

Opportunities for DEIC and Military/Security Force Environmental Assistance

Before exploring possible ways ahead for DEIC and environmental security cooperation, the many areas where opportunities lay will be reviewed. Following this review, the paper will conclude with an outline for a regional DEIC and environmental security assistance strategic concept.

Environmental Crime and Anti-Poaching

Assistance in combating environmental crimes such as poaching (terrestrial and marine) holds the potential to boost security force capability in numerous areas including: intelligence, interagency cooperation, border and air/sea space control, peacekeeping operations, counter-piracy, irregular warfare (IW) and counterinsurgency (COIN), forensics, and civil-security force relations.

Anti-poaching requires mastering and employing light infantry and small unit skills such as border and riverine operations, patrolling, tracking, ambush and counter-ambush against adaptable and well-armed (and often more numerous) irregular adversaries. These are directly transferable and relevant to contemporary peace and stability, counter-terrorism, COIN and other operations pitting state forces against hybrid criminal-insurgent, non-state adversaries.

For example, poaching was dramatically reduced in Zambia's North Luangwa Park in the late 1980s and early 1990s through a bottom-up effort initiated by biologists Mark and Delia Owens. Their strategy essentially morphed into a form of classic counterinsurgency that included: vigorous patrolling, development of human intelligence networks, sustainable village level development schemes (including micro-loans, agricultural assistance), 'flipping' poachers into anti-poachers, anti-corruption, separating communities from poaching/poachers, education, and building cooperation between government agencies, NGOs, foreign donors, and local communities.¹¹⁶

Similarly BDF officers interviewed both by this report's author as well as the Air War College's Dan Henk (2009) universally agreed that anti-poaching operations had provided them with invaluable field experience unattainable in a training environment. The anti-poaching mission has also facilitated the development and refinement of human, tactical and operational intelligence¹¹⁷ as well as logistical capabilities and techniques (Field Interviews 2009a).¹¹⁸

Combating IUU fishing and marine poaching requires skills and capability in maritime patrol, boarding, surveillance, human and technical intelligence, coastal community development and relations, interagency and international cooperation and coordination. All of these are directly transferable to small boat operations, anti-trafficking, border security, maritime domain awareness (MDA), and counter-piracy/maritime terrorism missions.

Humanitarian Assistance/Disaster Response

Regional militaries are all called upon to respond to disasters that acutely threaten both human and state security such as: floods, droughts, fires, human and animal disease outbreaks, hurricanes, oil and hazardous materials spills, etc. The BDF, for instance, has become an increasingly active participant in wildfire fighting and flood response. Effective emergency response can bolster government, military, and security force legitimacy as well as buffer against the impacts of disasters and natural hazards thereby promoting political and social stability and helping sustain development in the face of natural and climatic challenges. The capabilities and practices inherent in HADR also are directly transferable to post-terrorist attack consequence management as well as peacekeeping or coalition operations where humanitarian crises are at play.

There are myriad ways in which DEIC and related security assistance can be used to boost regional HADR capabilities and capacities particularly in the areas wildfire fighting and suppression, flood response, and livestock/livestock disease control. DEIC for instance could be used to help meet the need (as identified both by BDF officers and REHO) for development of and training in incident command systems.¹¹⁹

Facility/Force Protection and Site Selection

Floods, fires and other natural hazards pose significant threats to southern African military installations and camps.¹²⁰ Furthermore, increases in security and stability operations such as HADR, peacekeeping, nation building, and counter-insurgency have expanded the requirement for base camps and forward operating-facilities of a temporary or semi-permanent nature worldwide.¹²¹ SADC forces are no exception to this trend: this requirement will grow as their forces deploy on peacekeeping and other coalition operations abroad as well as anti-poaching and border security operations at home. Predominant criteria for base camp selection have been and continue to be tactical and logistical concerns. However, as military forces deploy into areas vulnerable to disasters and urban areas in weak/failing states; environmental considerations such as flooding, earthquakes, and exposure to toxic/hazardous waste, infrastructure failure or destruction (e.g. dams, water treatment facilities) will make environmental considerations more important.

DEIC and security assistance in integrating all-hazard approaches into vulnerability reduction and site selection practices and doctrine for both permanent and forward facilities could help improve the

effectiveness, robustness, and sustainability of regional military forces at home and deployed (in turn increasing their value and effectiveness as coalition and multinational force actors).

Interagency Cooperation and Coordination

Combating environmental crime, responding to livestock disease outbreaks, HADR, and other environmentally related roles and missions all require sound intelligence, information, and communications plus effective interagency and international cooperation and coordination. Improved capability and capacity in these areas are directly applicable to U.S. interests in bolstering regional peacekeeping, counterterrorism, and consequence management capabilities. DEIC geared towards improving interagency cooperation and coordination in southern Africa offers a relatively non-sensitive avenue to address interagency, intelligence and information sharing, and other issues that may be problematic to tackle from CT or traditional security angles.

Civil-Military/Security Force Relations

As noted earlier, there is considerable overlap between effective approaches in anti-poaching and COIN – both require, for instance, gaining the support of local populations. Because of the interconnection between environmental security and human security issues, environmental security operations nearly always require close interaction and cooperation with civil society and local communities. Consequently, properly designed and executed anti-poaching/anti-environmental crime efforts have the potential to bolster civil-security relations and provide avenues for re-casting the predatory and colonial legacies many African security forces labor under. For instance, effective participation in disaster response and relief, fire fighting, livestock protection, pollution response and prevention, and other environmental protection activities allow security forces to contribute to basic but popular human security concerns.

However, environmental security operations can produce negative or unintended consequences for civil-security relations. This is particularly salient in the areas of anti-poaching and resource protection/conservation. Throughout Africa many communities, scholars, and analysts view large fauna protection efforts as extensions of previous colonial policies whereby land, game, and resources were “protected” for the benefits of colonial regimes and settlers. Thus contemporary conservation efforts may be viewed as neo-colonial endeavors catering to the interests of wealthy foreign tourists, international conservation NGOs, and national political elites. Furthermore, the use of security forces to protect natural resources and/or secure resource rents for autocratic regimes and foreign corporations is widely resented throughout the continent. In order for environmental security endeavors to produce positive civil-security effects they must be conceived and executed in accordance along human security lines - protecting the environment and natural resources *for the people not from the people*.¹²²

Anti-poaching efforts have gained accolades, garnered considerable public respect, and enhanced the BDF's esteem.¹²³ However, even such successful environmental security results may have unintended follow-on effects. Rebounding elephant populations in Botswana have precipitated an increase in human-elephant conflict (HEC). This, in turn, could possibly erode public support not only for wildlife conservation efforts but for the BDF's reputation for the government amongst affected elements of the population. The BDF's effectiveness may also have eroded incentives to improve police and Department of Wildlife capability.¹²⁴ The depth of public and political support for anti-poaching is uncertain partly because broader stakeholder buy-in and public consultation has not occurred.¹²⁵ With the decline in poaching incidents, some politicians have also questioned the need to continue funding anti-poaching activities at current levels, despite the fact that without a robust security presence poaching would likely re-emerge.¹²⁶

Thus, environmental security roles, campaigns, and missions should be designed comprehensively and holistically and include robust civil-security (not just civil-military) components in order to enhance civil-security relations within southern Africa. Meanwhile the civil-military skills gained will also help better prepare regional militaries to conduct peace, COIN, stability, and HADR missions at home and abroad.

Within DoD there is a tremendous reservoir of experience of dealing with the community and civil sides of environmental security matters, including issues of protecting rights and resources of indigenous and tribal peoples¹²⁷ with which many African governments struggle. The U.S. military has also gained invaluable experience from Iraq and Afghanistan on the civil-military dimensions of dealing with irregular adversaries, local communities, and development issues – many of which have relevance to environmental security roles and missions in Africa.

DEIC seminars, conferences, training and education programs provide ideal venues for addressing the civil-security dimensions of environmental security. Civil-security training should be incorporated into broader environmental and related security assistance and training activities. Such efforts might not only improve support for as well as improve effectiveness of African environmental security efforts, but they might also provide U.S. personnel with a useful insight and understanding of locally unique factors (i.e. cultural, political, environmental etc.) impacting civil-security relations in the region.

Military Environmental Issues

There are numerous military specific issues that offer avenues for military to military engagement. Regional militaries lack capacity and expertise in areas such as energy efficiency and conservation, military land and range management, hazardous material/waste and management and spill response.

Most southern African countries and militaries also lack sufficient technical and human resource capacity in weather and climate monitoring and prediction. This has a range of effects from hindering flight operations in certain weather conditions to disaster early-warning to modeling and adaptation for climate change. While assistance in these areas at national levels should generally fall to agencies such as the U.S. National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), and NASA - DoD could assist in building regional militaries' meteorological and ocean/climate research capabilities as well as developing analytical capabilities and PME curriculum in the areas of national security-climate assessment and strategy issues.¹²⁸ Such assistance could also support ongoing DoD climate-security analytical efforts.

Professional Military Education/Doctrine and Strategy Development

Education of officers and civilian officials is critical if regional security and defense establishments are to effectively and sustainably address and plan for environmental security challenges. Education on specific issues can be achieved by using DEIC funds for deployment of mobile education teams and sponsorship of seminars and conferences. In order to build a sustained capacity particular consideration should be given to developing an environmental security capability at the BDF Defence College. The college, though still in its infancy, will soon be opening its programs to officers from throughout SADC. DEIC could be used to provide assistance with in-house and mobile curriculum and research program development, education and training of college faculty, and posting of U.S. subject matter experts as visiting faculty.

DEIC and environmental security assistance also could be used to help southern African militaries and security forces develop doctrine for environmental security roles and missions, which in turn would help ensure sustainable and consistent execution of roles and missions. For example, the BDF's anti-poaching role is more of a mission that has continued rather than a true role.¹²⁹ It is also unclear whether BDF involvement in anti-poaching will outlast the presidency and political popularity of Ian Khama,¹³⁰ the current President and former general, who initially launched the BDF anti-poaching effort. In a roundtable discussion conducted at the BDF Defence College, officers agreed that in order to ensure continuing success in anti-poaching and too improve upon existing performance, a systematic way for better capturing and institutionalizing experiences and lessons learned, consistently guiding operations and operational planning, and transferring the benefits of anti-poaching experience to other areas is needed.¹³¹

Summary

There are myriad areas where DEIC and environmental security assistance and military/security force engagement can be employed in furtherance of African and U.S. interests. Indeed many U.S. DEIC, security assistance and non-DoD environmental and development programs are already dealing with

various aspects of the challenges discussed in this report. However, piecemeal programs and approaches are unlikely to yield sustained strategic results even if they are individually appropriate and well-designed and executed. If the potential and promise of DEIC (and other forms of environmental security assistance) is to yield enduring and significant results, more resources are required and a comprehensive and a coherent strategy must be designed and executed.

DEIC/Environmental Security: Strategic Concept and Priorities

This report proposes a regional DEIC strategy be developed around four priorities and concepts: geography, environmental crime, HADR, and sustainability. This strategy should then form the foundation for a broader environmental security cooperation and assistance effort.

Geographic Focus: Anchors and Ink Spots

Southern Africa (as defined in this report) is an appropriate geographical area for a DEIC strategy since USAID Southern Africa and the State Department Regional Environmental Hub (REHO) for southern Africa define the region along the lines used in this report - as do a number of other important international and regional environmental actors. A southern Africa DEIC strategy would thus align with and better support on-going (non-DoD) U.S. government initiatives and priorities.

Initially the strategy should focus on four countries: Botswana, South Africa, Namibia, and Mozambique.¹³² South Africa is the region's leader and a major continental actor. South Africa, Botswana, and Namibia are also among the continent's and region's most promising democracies. As such they should be natural partners for the U.S. However, while U.S.-Botswana military to military relations are strong, they have been limited and strained with South Africa and Namibia. Environmental security has provided one of the only avenues of military to military relations acceptable to South Africa and Namibia. These four states are also involved in TFCAs with multiple regional countries. Botswana and Namibia are also key members of KAZA, OKACOM, and the Four Corners Initiative. Namibia and South Africa also have the region's best MCS capability.¹³³ The German Advisory Council on Climate Change has also identified South Africa, Namibia, and Mozambique as pivotal states for developing proactive climate change policies in the region.¹³⁴

In effect, a combined ink-spot and anchor strategy should be pursued which reinforces success and builds the capacity of key regional states to *themselves become sustained environmental security providers* to the rest of the region. This would also build the resilience and capacity of these states to withstand environmental shocks or second and third order effects of environmental insecurity generated elsewhere in the region and continent.

Operational Focus: Environmental Crime and HADR

Environmental crime threatens environmental sustainability, key economic sectors, and overall security and stability in southern Africa. This is an area particularly amenable to DEIC and environmental security assistance because regional security and military forces are directly involved in an array of counter-environmental crime roles and missions. Environmental criminal activities intersect with other transnational security concerns. Many of the factors that provide opportunity and operational space for environmental crime such as poor border security, weak interagency cooperation and coordination, underdeveloped civil-security sectors, lack of equipment and training, intelligence deficiencies, etc. also enable other transnational criminal and extremist threats.

Indeed “perhaps the greatest obstacle to countering-terrorism cooperation in southern Africa is the lack of any urgent or common perception of the threat posed by international terrorism.”¹³⁵ Thus DEIC and security assistance targeted at environmental crimes of concern to Africans should provide an avenue to countering other threats such as drug-trafficking, human trafficking and terrorism that are of particular concern to the U.S. The skill-sets and capabilities needed to counter environmental crime are transferable to other roles and missions including border and maritime security, civil-military operations, counterterrorism, counterinsurgency, peace operations, and stability and reconstruction. Since cooperation and assistance programs geared towards environmental crime cross-cut with so many other areas, this would ensure they meet a key DoD objective for international environmental cooperation which is that “all DEIC projects support the Security Cooperation Guidance and transform the program to increase its support to Global Defense Posture and military operation aspects.”

Existing vulnerabilities to natural hazards combined with predicted impacts of climate change mean southern Africa will face significant risks from natural hazard events - even if continued progress is made in governmental and societal capacity, development, and sustainability. Regional security and military forces are already called upon to respond to humanitarian crises and natural disasters. This is an area where security forces can directly respond to environmental threats, help minimize damage and destabilizing effects, and enhance civil-military relations and government legitimacy.

There is also considerable synergy in key areas required for HADR and combating environmental crime such as cross-border and interagency coordination and cooperation where single DEIC/environmental security programs and resources could contribute to multiple objectives. The general concepts and capabilities required to respond to natural disasters are similar, if not identical, to those required for responding to man-made environmental hazards (criminal or accidental) and terrorist incidents. Furthermore, focusing DEIC and other environmental security assistance on HADR and environmental crime would complement existing security cooperation programs in HA, maritime domain awareness (MDA), peace keeping as well as broader USAID and REHO agendas.

Conceptual Focus: Sustainability

Sustainability should be the overarching organizing principle for a regional DEIC strategy because “the environment is an important component of sustainability”¹³⁶ and because sustainability, in turn, contributes to security and stability “it is the key to protecting U.S. strategic interests in Africa”.¹³⁷ The use of sustainability as an organizing concept provides a basis on which a long-term strategy emphasizing prevention can be built that also aligns well with regional views of security. Sustainability is a guiding principle that underpins many on-going international, regional, national, and U.S. environmental and development programs in southern Africa. A focus on sustainability would further build upon existing TSC activities since, “Under AFRICOM’s umbrella of the Theater Security Cooperation (TSC), the command engages in several sustainability building and environmental security – related activities, including the DEIC and HA programs.”¹³⁸

Specifically all DEIC activities should be oriented towards supporting sustainability in a broad sense and designed to be sustainable themselves. Programs should promote (e.g. military use of clean or alternate energy, support wider USG or regional efforts at sustainable resource use, etc.) or protect sustainability (e.g. anti-poaching, EEZ surveillance, etc.). Individual events and activities should be designed to inculcate and employ sustainable practices (selection and use of “green” materials and practices, energy efficiency, etc.).

The incorporation of environmental security education in regional PME institutions and development of doctrine for environmental roles and missions would ensure the enduring effect of DEIC/environmental security programs by inculcating environmental security skills, knowledge, and ethos in regional military leaders while providing a mechanism for the formalization, diffusion, and examination of tactics, techniques, procedures (TTPs) and lessons learned.

Design and Implementation

In order to design and implement a strategy two prerequisite steps (which can also be DEIC activities themselves) should be taken:

- Conduct a regional environmental security threat and vulnerability assessment. DEIC funding could be used to fund research, workshops, and conferences geared towards producing such an assessment, soliciting input and developing support from key stakeholders, and designing meaningful measure of effectiveness/success (MOE/MOS).
- Identify and inventory on-going development, environmental crime, and HADR programs and initiatives in the region. Then matrix them with U.S. and partner nation objectives to determine specific areas where DEIC and environmental security assistance can play a meaningful supporting role or fill gaps. DEIC funding and activities could also be used to support such an effort.

In addition once a DEIC strategy is developed:

- Adequate resourcing is needed. Although DEIC proponents argue that it offers a low-cost high impact approach, this does not mean DEIC can be effective if it is under resourced and funding not sustained. Current funding and activity levels are insufficient to produce *sustained strategic* effects. Even for a relatively modest DEIC strategy and program to have an enduring and meaningful impact it would have to be funded at much higher levels than is the present paltry case.

An expanded DEIC/environmental security assistance program requires additional human resources. Although individual DEIC and environmental security activities (training, workshops, etc.) can be supported by drawing upon expertise within DoD and from other agencies – an expanded effort would require more bodies to manage, plan, direct, and coordinate. Strategic level environmental security expertise is limited to a small community of persons at DoD, in various service agencies (such as the Army Environmental Policy Institute), AFRICOM, and PME institutions while Defense Cooperation and Security Assistance Offices in southern African are understaffed and heavily tasked.

Conclusion

The varied interconnections between environmental and security issues in southern Africa pose numerous opportunities and challenges to regional security and U.S. regional strategic interests. Through low-cost, high impact means, a concerted DEIC strategy and effort has the potential to significantly enhance regional security by capitalizing on and helping sustain positive trends and existing capabilities while buffering and mitigating against environmental pressures that could undermine security and progress. This will require a strategy that embraces sustainability; is clearly defined and focused in terms of geography and threats; integrates with wider USG, African, and international efforts; and is properly resourced.

Endnotes

¹ For purposes of this report ‘Southern Africa’ is defined according to common usage amongst geographers and includes the countries of: South Africa, Lesotho, Swaziland, Botswana, Namibia, Mozambique, Angola, Zambia, Zimbabwe, Malawi, and Madagascar. These are also the countries covered by USAID southern Africa and U.S. Department of State’s Regional Environmental Hub (REHO) for southern Africa. When data or research focused on SADC countries (which includes the previously listed countries plus: Democratic Republic of the Congo, Seychelles, Mauritius, and Tanzania) is presented ‘SADC’ is used in lieu of ‘Southern Africa’.

² Henk, D. 2006. The Environment, the US Military, and Southern Africa. *Parameters*, 36(2): p. 110.

³ Ibid.

⁴ The ESI is a composite score factoring in ecosystem states, environmental stresses, human vulnerability to environmental stresses, societal and institutional capacity and concern, and global stewardship/assistance that benchmarks the ability of countries to protect their environments and provides a yardstick of human development (ESI 2006, 1).

⁵ (ESI) *2005 Environmental Sustainability Index*. 2006. (New Haven: Yale Center for Law and Environmental Policy, Center for International Earth Science Information Network Columbia University.

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- ⁶ Ibid, 10.
- ⁷ Henk, D. 2008. Human and Environmental Security in Southern Africa: The Kavango-Zambezi (KAZA) Trans-frontier Conservation Area Project. Paper Presented at 49th ISA Convention, San Francisco, CA, 26 March. p. 15.
- ⁸ U.S. Embassy, Gaborone. 2008. *OKACOM Secretariat and ODMP Launched During World Wetlands Day Commemorations*, unclassified report 11 Feb.
- ⁹ DFID (Department for International Development). 2007. *Second Order Water Scarcity in Southern Africa*. <http://www.e-collaboration.co.uk/water/index.html> (accessed 25 Sep 2009).
- ¹⁰ Hanlon, C. and J. Hanlon. 2001. *Mozambique and the Great Flood of 2000*. (Indiana: University Press) p. 176.
- ¹¹ Programme to Stop Illegal Fishing (SADC). 2008 *Study and Analysis of the Status of IUU fishing in the SADC Region and an Estimate of the Economic, Social and Biological Impacts*, Vol. 2, pp. 6-8.
- ¹² Schubert, R. et. al. 2008. *Climate Change as a Security Risk*. (London: EarthScan), p. 131.
- ¹³ Ibid, p. 138.
- ¹⁴ Cincotta, R., Engleman, R. and Asatasion, D. 2002. *The Security Demographic Population and Conflict after the Cold War*. (Washington, DC: Population Action International).
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- ¹⁸ Gaotlhobogwe, M. 2009b. Botswana: Kasane Under Threat of Floods. *Mmegi (AllAfrica.com)*, 30 March, <http://allafrica.com/stories/200903301725.html>; More Floods Expected. 2009. *AllAfrica.com*. 15 May, <http://allafrica.com/stories/200905150630.html>.
- ¹⁹ Field Interviews. June 2009. Non-attribution interviews conducted by author with BDF and security officials in Gaborone and Kasane.
- ²⁰ Turton, A. 2005. Constructing Risk: Adaptive Capacity and Water Scarcity in Southern Africa at *Forum on Drought Risk and Development Policy Nairobi*, 31 Jan – 2 Feb.
- ²¹ Schubert, R. et. al. 2008, p. 138.
- ²² Boko, M. et. al. 2007 “Chapter 9: Africa,” *Fourth Assessment Report of the IPCC*. (United Nations Intergovernmental Panel on Climate Change), p. 441.
- ²³ Mutangadura, G. et al., 2005. Assessing the Progress Made by Southern Africa in Implementing the MDG Target on Drinking Water and Sanitation. *Assessing Sustainable Development, Africa’s Sustainable Development Bulletin*. (Addis Ababa: Economic Commission for Africa) pp. 19-23.
- ²⁴ Southern African Research and Documentation Centre 2008.
- ²⁵ Field Interviews. June 2009. In an exercise conducted by author as part of a CCMR Mobile Education Team the 2009 staff college class was asked to identify key future national security threats, energy was uniformly cited as a significant looming challenge.
- ²⁶ Blench 1996, pp.4-5.
- ²⁷ Gaotlhobogwe, M. 2009. Botswana Wildlife Declines by a Staggering 90 Percent – Report Says. *All Africa.com*, October 5, <http://allafrica.com/stories/printable/200910070579.html>, accessed 7 October 2009.

²⁸ UNHCR. 2003. Minorities at Risk Project Assessment for San Bushmen in Namibia, <http://www.unhcr.org/refworld/docid/469f3ab7c.html> [accessed September 24, 2009].

²⁹ Sennamose, O. 2009. Land Dispute Risks Sanctuary Future. *Daily News* (Botswana), June 9, p. 2.

³⁰ For example, in 1999 the South African government signed an agreement returning 100,000 acres to the Khomami San (Gall 2002, 239-240). Namibia passed an affirmative action law in 1998 which gave preference to disadvantaged groups including the San (UNHCR 2003). In December 2006 the High Court of Botswana ruled that the government of Botswana unlawfully and unconstitutionally removed from the Central Kalahari Game Reserve and been unlawfully denied “basic and essential services.” (High Court of Botswana 2006, 2) These legal battles and ensuing decisions, however, have been contentious and in some cases have soured relations or raised suspicions between executive and legislative branches of government, NGOs/international organizations and national governments, international media and states, etc.; inter-actor relationships which are crucial to get right for pursuing sustainable economic and democratic development.

³¹ This can have interesting civil-military and civil society-security forces implications which will be examined in more detail later. For example, Botswana wildlife and police officials have been accused of abusing San (Gall 2002) while the BDF has maintained its professional image has not been implicated in the San controversy and has effectively used San trackers to support its anti-poaching operations.

³² Schubert, R. et. al. 2008, p. 139.

³³ Staff Writer. 2009. Madagascar to Curb Illegal Logging. *Afrol News*. January 21, <http://www.afrol.com/articles/15348>, accessed 4 November 2009.

³⁴ Olderman 1991 cited in Schubert et al. 2008; Meena, S. 1996. Environmental Security and Displaced People in Southern Africa. *Social Justice*, 23 (4): p 127.

³⁵ Meena, S. 1996, p. 127.

³⁶ Food insecurity is a perennial regional problem. For example, of the Limpopo basin’s (413,000 km² in Zambia, Botswana, Mozambique, South Africa) population of 14 million people about 1 million currently rely on food aid and according to Adrian Louw of the South African Agricultural Research Council about 10% of that population is expected to migrate within a few years. (Nduru 2009)

³⁷ Boko, M. et. al. 2007, p. 436.

³⁸ Ibid, p. 439.

³⁹ Ibid, p. 446.

⁴⁰ Schubert et. al. 2008, p.138.

⁴¹ Boko et. al. 2007.

⁴² Ibid, p. 449.

⁴³ Ibid, p. 449.

⁴⁴ Field Interviews. June 2009. Anonymous interviews conducted by author with park rangers and former anti-poaching personnel, Mdikwe Game Reserve, South Africa.

⁴⁵ Clark 2003 cited in Boko et. al. 2007, p. 448.

⁴⁶ Boko et. al. 2007, p. 446.

⁴⁷ Ibid, p. 439.

⁴⁸ Nyoka, B. 2003. *State of Forest and Tree Genetic Resources in Dry Zone Southern Africa Development Community Countries*. (Rome: FAO), <http://www.fao.org/DOCREP/005/AC850E/ac850e03.htm#TopOfPage>, accessed 4 Nov. 2009.

⁴⁹ Ibid.

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- ⁵² Ibid.
- ⁵³ Nevin, T. 2009. Botswana Joins the Uranium Club. *Business World Botswana*, No. 10, pp. 12-14. Also World Nuclear Association. 2009. *Uranium in Africa*. <http://www.world-nuclear.org/info/inf112.html>, accessed 5 Nov. 2009.
- ⁵⁴ Various media outlets have speculated (though inconclusively) that North Korea have expressed interest in obtaining uranium from Zimbabwe, while an agreement has reportedly been signed between China and Zimbabwe to explore uranium mining (Nevin 2009).
- ⁵⁵ du Rand, A. 2008. *The Future of Uranium Mining in Africa*. (South Africa: Institute for Security Studies), http://www.iss.co.za/index.php?link_id=4056&slink_id=5710&link_type=12&slink_type=12&tmpl_id=3 ISS today, accessed 5 Nov. 2009.
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- ⁵⁷ Nyoka 2003.
- ⁵⁸ *Afrique en Ligne*. 2008. Zambia Loses Money on Timber Following Ban on Exports, http://www.illegallogging.info/item_single.php?item=news&item_id=2740&approach_id=, accessed 4 Nov. 2009.
- ⁵⁹ Mweninguwe , R. 2008 The Charcoal Trade in Malawi: Burning Away the Hope of the Third World. *Natural Resource News Service*, August 14, http://naturalresourcesnewsservice.org/index.php?option=com_content&view=article&id=35&Itemid=63, accessed 4 Nov. 2009.
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- ¹¹² Craddock, 2009, p. 27; *Annual Defense Environmental Report to Congress* (Appendix Q, p. 2). 2005. FY2001, 2003, 2004 DEIC budgets respectively were \$2.4 million, \$1.2 million, and \$1.4 million (does not include additional supporting contributions from other sources which can add an additional .5 to 1.5 \$million per year) (FY 2001 Defense Environmental Quality Program Annual Report to Congress, 141; Annual Defense Environmental Report to Congress 2005*, Appendix Q p. 2). These figures do not include other theater security cooperation activities that may have environmental crossovers (some HADR or bi-lateral affairs activities for instance). * 2005 is the last year where specific DEIC breakdown is given in the report.
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- ¹²⁰ During the course of fieldwork for this report, the author incidentally had a chance to meet with 2nd Infantry Brigade Commander Brigadier L. Motsumi on his return from inspecting a BDF camp flooded as a result of rains unusual for the season.
- ¹²¹ Corson and Jaspardo, 2006, p. 78.
- ¹²² This of course does not mean protecting the environment so it can be degraded or used but rather protected/conserved/managed for the benefit of societies and communities rather than strictly elite and special interests.
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- ¹²⁴ Henk, 2009, p.285.
- ¹²⁵ Ibid.
- ¹²⁶ Field Interviews. June 2009. Non-attribution interviews conducted by author with BDF and security officials in Gaborone and Kasane.
- ¹²⁷ The *DoD American Indian and Alaska Native Policy* and its implementation, for example, has given many civilian DoD officials and military officers experience in dealing with indigenous peoples on a variety of cultural, environmental, and natural resources matters.
- ¹²⁸ DoD has commissioned a number of studies on climate-security matters while service organizations such as the Office of Naval Research have long been involved in studying meteorological, climatic, and oceanographic issues with environmental security relevance. The U.S. Navy has established a climate change task force while the U.S. Naval War College now has a climate change and security working group.
- ¹²⁹ Field Interviews. June 2009. Non-attribution interviews conducted by author with BDF and security officials in Gaborone and Kasane.
- ¹³⁰ Henk, 2009, p.285.
- ¹³¹ Roundtable (non-attribution) on Anti-Poaching Issues and Research, held at BDF Defence College, June 2009.
- ¹³² This should not preclude other states from inclusion in regional DEIC events or from specific types of assistance essential to furthering U.S. regional goals and interests. Rather the focus of DEIC and prioritization of activities and resources should be oriented to the four states mentioned above.
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