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**THE SHAPING OF POLICY IN SUPPORT OF NATIONAL AND
ENVIRONMENTAL SECURITY FOR THE REMEDIATION OF COLD
WAR RELATED ECOSYSTEM DEGRADATION IN THE
COMMONWEALTH OF INDEPENDENT STATES**

BY

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USAWC STRATEGIC RESEARCH PROJECT

**The Shaping of Policy in Support of National and Environmental
Security for the Remediation of Cold War Related Ecosystem
Degradation in the Commonwealth of Independent States**

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ABSTRACT

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TITLE: Linking National and Environmental Security for the Remediation of Cold War Related Ecosystem Degradation in the Commonwealth of Independent States

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This paper will focus on the linkage between the national security interests of the United States, and ecosystem degradation caused by the Cold War, paying particular attention to the shaping of preventive defense policy in the Commonwealth of Independent States. The paper reviews the issue of preventative defense by linking Robert Blackwell's framework of time, geographic priority and connectivity to the end, ways and means of national strategic planning. It will then assess the relationship between these two "testing criteria" and apply them to two environmental case studies – specifically the contamination of the Aral Sea basin coupled with the destruction of the basin's historical economic sustainability and the environmentally induced conflict in Tajikistan. The paper will then conclude by advocating a more aggressive approach, by the United States military, in pursuing environmental remediation efforts through the use of a combination of brigade level engineers units and the United States Army Corps of Engineers.

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Introduction

The demise of the Soviet Union as a world power in the early 1990s provided the United States with an opportunity to institute a new set of priorities allowing National Security policy makers to focus on the by-products of the Cold War. Some of the more stressing priorities, as we move into the 21st century, can be found at the nexus between national security and the environment. The election of President Clinton in 1992 energized this new focus. This is evidenced by speeches made by then Secretaries Warren Christopher and William Perry, who raised the hopes of environmentalists that U.S. policy was finally embracing the reality that security, along with economic sustainment, can be linked to environmental conditions. Both secretaries focused on the widespread contamination of the ecosystem, the depletion of the world's natural resources, the requirement to address environmental damage through reclamation efforts, and the creation of demilitarization policies to deal specifically with the serious environmental problems that might keep some fledgling democracies from reaching their potential.

As the United States government, and other agencies, began linking security and environmental issues, certain questions had to be addressed. For example, what is the object of security; what is the focus of the security interest; what is being secured against; and who is performing the security and with what means are they doing it? Depending on the organization the way the question is phrased and even the answer will vary.

Some non-military organizations such as the Department of State (DOS) gear their efforts toward issues involving human and sustainable economic development. The goal is to address the root cause of the environmental problem through enhancing human

well being and economic development, which in turn will improve international security. A military organization, such as the Department of Defense (DOD) is focused on the containment and prevention of specific environmental threats that if not resolved successfully will lead to involvement of more traditional national security means such as military force. Finally, agencies such as the Non-Government Organizations (NGO) will look to narrow "niche" areas in the environmental field and participate in resolving these problems at the international level within those self-imposed parameters.

In linking national security concerns with environmental interests it is interesting to note that the products of environmental degradation caused by decades of combat training and testing new weapon systems can be found on virtually every United States and former Soviet military base. Each side proved adept, in their particular area of interest, at developing large numbers of lethal nuclear and chemical munitions. These highly effective weapons required massive sums of hazardous fuels and chemicals to support their use and some of these munitions, the biological and chemical weapons in particular, proved difficult to dispose of when the "shelf life" was complete or when obsolescence set in. All of the participants of the Cold War are facing expensive, labor intensive, environmental restoration projects and most appear to be paralyzed at the mammoth scope of the endeavor. Common problems from this period were the huge numbers of underground storage tanks filled with fuels and solvents resulting in chemical spills that polluted the aquifers. Even more ominous were the toxic waste dumps similar to the radiological storage pits found at Oak Ridge, Tennessee and Tomsk in the Ural mountains.

The later half of the 20th century has seen an adverse change in the environment, due to human activity, as never seen before. Environmental concerns and their impact on sociological and economic life have become a science unto itself as multiple disciplines such as anthropology, biology, chemistry, and engineering, to name a few, have provided tools for the environmental scientist. It includes the study of the decline of biodiversity (animal and plant life), air and water pollution, deforestation and desertification, transboundary pollutants and the degradation of renewable and limited resources.¹ The impacts of these environmental problems have led, in many parts of the world, to: the state of crippling poverty that threatens attempts at sustainable economic and environmental development; global pollution where more than a billion people in urban areas breath air containing over 100 million tons of sulfur dioxide and 125 million tons of carbon dioxide, also the prime factor causing global warming; and a host of other issues ranging from water contamination and shortages of solid waste treatment facilities.²

The term most often used by the professionals at the Center for Strategic Leadership to describe the framework that links security concerns with the environment is “environmental security”. It is used extensively by not only officials within DOD, but also by the Department of Energy (DOE), and the Office of the Director of Central Intelligence (CIA). In fact, DOE has gone so far as to create a “Center for Environmental Security” at its Pacific Northwest National Laboratory and the CIA has created the “DCI Environmental Center”.

Environmental security clearly extends the debate of what security in the 21st century will entail within the Ends, Ways and Means framework of national strategic planning. Environmental professionals are clarifying the policies “the Ways” that will

have to be adopted at the regional and international levels to insure national security is achieved. In short, nations wanting security “the Ends” will have to pay for it. The question then becomes what resources “the Means” will they have to expend in order to achieve those ends?³

As part of its concern for emerging democracies, some of the United States Strategic focus is geared toward the CIS. The former Soviet republics are fledgling democracies struggling to balance economic necessity for their people while at the same time improving the appalling environmental conditions left by the retreat of communism. Following the period of euphoria provided by their independence, the nations of the CIS are now faced with the realities of “going it alone” and environmental improvement, due to the tough economic times, is taking a back seat. Additionally, the members of the CIS are the focus of the United States nonproliferation initiative to prevent the spread of Weapons of Mass Destruction.⁴

This paper will function as an overview of the definition of environmental security, efforts by NATO and the United States to shape policy and support environmental security within the CIS by providing relief in the arena of environmental damage, scarcity, natural resource replenishment and technology transfer of environmentally sound equipment.

International Environmental Security and the CIS

In 1996, then Secretary of Defense William J. Perry, in a speech to the John F. Kennedy School of Government, called for a new national security paradigm to address national economies, the environment, and preventative diplomacy. In that speech,

Secretary Perry said, "America's security policy in the post Cold War era requires us to take advantage of that opportunity: to make preventive defense the first line of defense for America, with deterrence the second line of defense, and with military conflict as the last resort."⁵

Perry compared and contrasted preventive defense to preventive medicine. In preventive medicine conditions are created that support a healthier lifestyle and renders disease less likely. This in turn leads to the conclusion that surgery may never be necessary or the disease is prevented at low cost. Preventive defense can be viewed in the same manner. It creates the conditions for peace through a carefully crafted policy of coexistence and cooperation that centers the attention of the United States on resolving those problems that threaten the sustainable development of regional states. This, in turn, makes war less likely and foreign intervention unnecessary.

The opportunity foreseen by Perry was the use of resources available to the United States to shape the foreign policy arena in such a manner that the use of military force might not be required in the near future. Later the 1996 National Security Strategy (NSS) was molded to reflect Perry's position. This was followed by the altering of the National Science and Technology Council's National Security Science and Technology Strategy, a document on the same level as the National Military Strategy, to include terminology stating that regional or civil conflicts, hastened or exacerbated by environmental stress, could involve the United States in costly and hazardous military interventions, peacekeeping or humanitarian operations.⁶ The focus of the strategy was to reduce or eliminate such environmental stress so that military forces would not be needed.

Secretary Perry gave the Deputy Under Secretary of Defense (Environmental Security) (ODUSD-ES) the leading role of coordinating and planning the requirements of strategic environmental shaping. ODUSD-ES is primarily concerned with the cleanup, compliance, pollution prevention, maintenance, technology development and training to support DOD's worldwide operations. This office, on a smaller scale, also shapes preventive defense policy at the international level.⁷

The linkage of preventive defense and environmental security are relatively new areas of U.S. foreign policy that involve interagency and multilateral participation. Together, with the DOS, EPA, and in some cases DOE, DOD facilitates the investigation of and response to environmental factors that can lead to instability and possible conflict.⁸ This work is done in a cooperative format involving the defense and environmental agencies in the host nation.

For its part, ODUSD-ES facilitates the interagency environmental coordination and establishes policy that will link the department's activities with the needs and requirements of the country involved in the investigation. The Under Secretary also takes the lead role in coordinating these efforts with the appropriate Combatant Commander in developing an environmental shaping strategy that will work in conjunction with the preventive defense initiatives of the DOD.

An example of how preventive defense and environmental contingencies might be linked together can be found in the CIS. Since 1991 the CIS has witnessed four armed conflicts. Specifically, these have occurred in Nagorno-Karabakh and surrounding portions of Azerbaijan, in the South Ossetian and Abkhazia regions of Georgia, in Tajikistan, and in the failed "would be" state of Checheniya in Southern Russia. These

wars have directly harmed the environment due to the destructive activities in the conflicts. They have displaced populations, destroyed infrastructure, and contaminated large areas with hazardous materials and waste. Yet, by looking at the causes of the conflict we can see that each of the wars, to one extent or the other, match the National Defense University's 1997 Strategic Assessment for environmentally induced conflict. Specifically, it identifies environmental scarcity (lack of natural resources for sustained economic growth), disasters (natural such as an earthquake or man-made such as the death of a river by pollution), and population migrations (as people move to escape drought, war, or to find a better standard of living) as flashpoints that may cause internal conflict and thus require the United States to use a military response to stabilize the situation.⁹

Recognizing the principle that an environmental issue may have a significant impact on U.S. national security is easy. Determining which issue will have an impact and knowing its relative priority is a daunting challenge. There is no easy answer to this difficulty, particularly in the interagency and international arenas. Each organization approaches the environment from widely differing perspectives – human and national security.

In his book A Taxonomy for Defining U.S. National Security Interests in the 1990s and Beyond, Robert Blackwell provides the reader with a firm criteria for testing the relationship of external threats to national security interests. The three criteria he mentions are the immediacy of the threat in terms of time, the geographic priority of the threat, and the connectivity of the threat.¹⁰ To illustrate how these three criteria might be linked one can look to the dams built by Turkey at the headwaters of the Euphrates River.

When the dams were built 65% of the waters flowing through Syria's portion of the river was diminished. In order to compensate the Syrians built dams to collect enough water for its own use. This, coupled with the Turkish dams, reduced the water flowing into Iraq by a total factor of 85%. Time became a factor because of Iraq's immediate need for water. The geographic priority of the issue centers on three regional powers. The connectivity of the leading to the problem was water. This paper will now examine, in further detail, these criteria from an environmental perspective.

Environmental issues impacting national interests that involve close proximity in time and geo-space will be of great importance. A factor such as increased migration of Christian Armenians into the Nagorno-Karabakh region within Muslim Azerbaijan would be considered significantly important. The ancient cultural hatred "connectivity" between these two peoples could easily lead to population "geographic priority" migrations that over "time" could effect the region's environmental and sustainable stability and require peacekeeping operations similar to that found in Bosnia today.

Another influencing environmental issue would be the threat to the oil economies of Azerbaijan, Kazakhstan and Turkmenistan because of the expanding Caspian Sea into the national oil fields of these countries.

Just 15 years ago the situation was very different when Soviet engineers began to draw plans to divert a portion of the Caspian Sea displayed a large, dry, salt bed in this 1972 Volga River into a shrinking Caspian Sea. As Figure 1 indicates, the shrinking photograph. Before the plans could be implemented the sea began to rise at a rate of half a centimeter a year desolving the salt bed so prominent in earlier photographs (Figure 2). The mechanics behind the situation is simple. In the 1930s, as the Soviets diverted water

from the Volga for agricultural and industrial purposes the sea level declined over a period of 50 years.



Figure 1

In the 1980s, a climate change occurred north of the Caspian resulting in an increase in the water supply reaching the sea. From the 1980s to the present, the sea level has increased 1.4 meters and will continue to rise another 1.5 meters by the year 2010.¹¹

A third threat in the CIS would be the distribution of ethnic Russians throughout

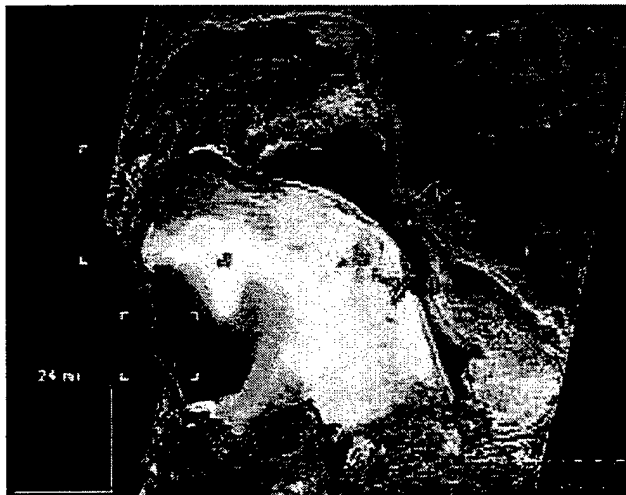


Figure 2

the region and their “minority” rights as seen from Moscow. Today, an exodus is taking place within the region as tens-of-thousands of ethnic Russians migrate into the Russian

homeland. Unfortunately as we compare this migration to Blackwell's criteria of "time", the event is occurring so rapidly the state has yet to develop the sustainable capacity to absorb them and this has resulted in the establishment of receiving centers that offer little hope to the immigrants. Then, a forth threat is the massive environmental damaged caused in the CIS by the Soviet era industrial machine in its attempt to keep pace with the West. Here the problem is who will absorb the cost of cleaning the damage and what will be the time frame?

Using Blackwell's approach of time, geographic presence and connectivity in assessing the principal environmental issues within the CIS, those issues most likely to have a significant influence on the national security interests of the United States are multiple. By linking Blackwell's criteria with the National Defense University's core environmental concerns and a picture of great complexity can be seen. First, there is the issue of scarcity, or overuse of natural resources (oil, water, fish, and arable land) critical to the political stability or economic wellbeing of a country or health of the population. Here, the shifting patterns of the population "over time" to reorient itself along ethnic lines can defeat the capability of a geographic "geographic priority" area to sustain it. This results in the depletion of those resources "connectivity" and forces the importation of materials.

Then, there is the matter of natural (flood, fire, earthquake, hurricane, typhoon) or man-made disasters (oil spill, toxic, and hazardous waste disposal, fissile material accident) which threaten the political stability or economic wellbeing of a country or health of the population. Using Blackwell here we can see the linkages between the timing of the population influx, the added stress on the limited agricultural and industrial

capacity of the area, and the potential man-made disaster as increased irrigation not only cause erosion, but brings the subsurface salts in the area of Central Asia to the surface.

This does not mean the United States should ignore other less immediate environmental threats within the CIS such as air and water pollution, biodiversity loss, and the expansion of brownfields within the industrial areas in cities. These are secondary issues causing great strife at the local level that could lead to various levels of unrest among the population. Many of these are related to human health and should be coordinated with a broad range of cooperative efforts. Interagency leadership provided by the Environmental Officer, Bureau for Eastern Europe, Office of Sustainable Development, United States Agency for International Development (USAID) would be more suitable than DOD for this purpose.¹² However DOD might still have an important role in supporting the strategy of USAID in this area by providing a broad range of experience and expertise that might prove relevant to the environmental security and sustainable development issues being pursued. This assistance might come in the form of design facilitation to clean up water and sewer problems, providing specifications for the cleaning of contaminated soils due to underground storage tanks, or provide personnel to train the environmental managers within the various CIS countries in waste management techniques. Additionally, DOD participation in less immediate environmental issues within the CIS may promote a broad range of dialogue, on a regional basis, with the military leadership in those countries.

Environmentally Induced Conflict Case Study – Tajikistan

Briefly, this paper will analyze issues discussed in the previous section by examining a “case study” of how conflict can be specifically caused by environmental factors. For this review, the paper will use the situation found in Tajikistan in the early 1990s.

Located just north of Afganistan, Tajikistan is in the main flow area for the Aral Sea basin. During the Cold War the Soviet Union invested in the area heavily by building industrial complexes in the cities (Dushanbe and Khunjand) and major villages (Qurghonteppa and Khorugh). The Soviet Union also created an extended agricultural network in the region and more than doubled the crop production of the area by introducing modern mechanized farming methods and non-indigenous crops (cotton, beans and new grape stocks).

As the industrial complex in Tajikistan grew through the period of the Cold War, it caused massive water pollution and ground pollution. Despite some efforts to limit the environmental damage through the use of water treatment systems, at any given time less than 50% of the industrial water purification systems in the country operated properly over the past 20 years. Also, municipal wastewater treatment plants in the country rarely work properly and this in turn forced plant workers to dump large quantities of unprocessed waste into the rivers and streams on a daily basis.

The agricultural system in the region is composed of approximately 945,000 hectares. Little of the land is arable, so irrigation is involved in growing 98% of the products. At present 36% of the irrigated land, 340,200 hectares, is now considered erosion-unsafe. Additionally, 18 % of the farmed area has undergone salinization and is

no longer capable of supporting crop production. Salt is a major problem in the entire central Asia area due to its presence just below the surface.¹³ The end result of this is over 54% of the available land for farming is no longer capable of sustaining crop production due to poor management practices.

Added to the industrial and agricultural problems, deforestation is taking place due to an expanding population demanding wood for fuel and products. As forests are harvested there is a corresponding expansion of the region's desert (similar to the expansion of the Sahara in Africa) and a bleak environmental picture is drawn. It has also led to a decrease in the nutrient potential of the consumable agricultural products and a reduction of production per hectare. This degradation of the environment, coupled with 65% of Tajikistan's population receiving contaminated water from unprocessed tap sources, has led to large outbreaks of typhoid fever, hepatitis, dysentery and other infectious illnesses. Finally, the life expectancy in the region has actually decreased in the past 20 years!¹⁴ Though there is little historically NATO or the United States could have done to prevent this, today there is close military to military cooperation to study the effects and develop solutions. This assistance, in turn, provides a platform for better understanding and trust at the military level.

After Tajikistan declared its independence in 1990, a brief period of peace fell on the region. Then, in 1992 a struggle developed between the government and two regional groups in the southern part of the country who cited the "decline of the quality of life" and "inability of the government to provide for the people" as their reason for going to war. Of particular concern of the south was the extensive illnesses caused by the pollution found in the Kofarnihon and Vakhsh Rivers. In 1994 a cease-fire was signed

with the government agreeing to improve the waste systems leading to the water pollution in the south.¹⁵ To date, despite a presidential decree, little has been done on the government side to correct the problems and periodically conflicts erupt when a new illness breaks out in the south.

Although this conflict did not involve elements of the United States, Russia did send in troops to stabilize the area and address some of the environmental issues. Since then the United States, Russia and NATO has worked together to study the issue at hand. Using Blackwell's three principles the following situation is being reviewed. In time, if the government does not improve the health of its people by improving the environmental conditions within the country, the geographic area could become unstable because of the rise of Islamic fundamentalism coming from Afghanistan.

Preventive Defense and Shaping: NATO Environmental Policy in the CIS

In the early 1990s the defense sectors of many nations, recognizing the need for more communication based on the commonality of environmental management, began to discuss the problems of Cold War related environmental issues, and sustainable development in several informal meetings. Soon afterwards, in 1993, the United States European Command, took the lead in shaping the environmental preventative defense arena by initiating a program of Military-to-Military cooperation with Eastern Europe and Former Soviet Republics.

These military entities, working together, began to discuss the challenges of environmental security, recognizing the diverse nature of the problem, ranging from environmental cross-border problems, natural disasters, industrial contamination, and on

to problems with sustainable development. In 1992, at the Earth Summit in Rio de Janeiro, 170 heads of state, to include President Bush, foresaw the need for sustainable development and the need to clean up the environmental problems caused by the Cold War and the developed nations.

Today, as highlighted by the Tajikistan case study, the dual threat of population growth and economic development is threatening the environmental security agreed to at Rio and this in turn, is having a profound effect on the countries of the CIS. This does not mean that the accord is being ignored outright. Instead it points to the rise of a second tier of developing nations as they approach developed nation status and the stripping of their environmental assets to satisfy a growing population demanding consumer goods.

The United States and NATO, after studying the nations of the CIS and working with their militaries, now realize there are two levels of developing nations. The first level involves those nations, like the Ukraine, with adequate resources and wealth. They find themselves in a good position to achieve developed nation status. The second level is comprised of nations with insufficient resources, large quantities of environmental damage, and a lack of hard currency. These countries, while enjoying some current success at supplying their population demand for goods, are well on their way to becoming failed states. Unfortunately, some of these “future” failed states, such as Belarus, a country with an incredible capacity to produce finished goods that have less value than the original raw materials, do have the resources to achieve their goals, but political developments for the transition to private enterprise market economies are being blocked by a leadership still tied to the centrist Soviet style system.¹⁶

The NATO Committee on the Challenges of Modern Society (CCMS), with its offices in Brussels, Belgium, now has the lead of managing the program of studying the sustainable development and environmental conditions in East Europe and the CIS. It has initiated a series of civilian and military “pilot studies” on environmental issues of mutual concern to several member states. Since 1993 non-member states have been invited to participate in these studies with more regularity. One such CCMS effort is in the pilot study on Reuse of Former Defense Lands, which covers the pollution management challenges such lands often pose. Another venture widely participated in is the study of the current problems involving the shrinking of the Aral Sea.

NATO Pilot Case Study – The Aral Sea

The environmental deterioration in the Aral Sea basin differs from other similar events: primarily, it was a planned and phased event by the economic and environmental planners of the former Soviet Union. Located in Central Asia it is bound on the north by the country Kazakstan and on the south by Uzbekistan. This one time 4th largest lake in the world (see Figure 3) a closed water basin with no outlet to an ocean and is fed

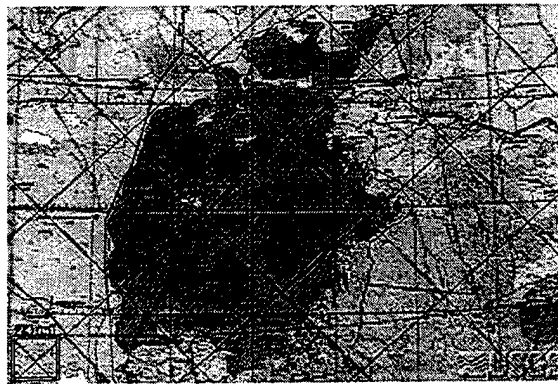


Figure 3

by the run-off of a landmass similar in size to half of the United States.

The Aral is fed by a multitude of rivers and streams. The two largest rivers are the Amu-Darya and Syr-Darya. In the early 1960s the Soviets diverted the water from the sea's two primary feeder rivers for the purpose of agricultural irrigation. The planning and implementation of this program were so successful that from 1974 to 1986 no water from either of these rivers reached the sea.¹⁷ In 1960 the Aral Sea had an average area of 67,000 sq-km, an average depth of 54 meters, and a salinity of 10 grams/liter. In 1994 the sea, through years of evaporation, separated into two systems – the larger southern sea and much smaller northern sea. Currently, the northern sea has an average area of 3,152 sq-km, an average depth of 41 meters, and a salinity of 25 grams/liter. The southern sea has an average area of 21,000 sq-km, an average depth of 32 meters, and a salinity of 68 grams/liter (see Figure 4).



Figure 4

So, for what irrigation purpose did the Soviet planners decide to drain the two major river systems feeding the Aral? The Aral was drained for the cotton “independence” of the Soviet Union, a Cold War objective. In fact, of the 90 cubic kilometers of water taken out of these rivers for irrigation each year, two-thirds are used for the irrigation of cotton fields.

Unfortunately, the planners failed to see the long-term effect of their actions. Principally, they did not take into account the moderating influence of the Aral on the weather patterns and seasonal changes in Central Asia. Over the past 30 years the growing season in the region has become much shorter; today, spring comes to the area a week and a half later and autumn arrives two weeks earlier.¹⁸ The Soviets also failed to see the “death” of the Aral Sea basin’s principle secondary economic activities – the harvesting of Aral sturgeon (a fish on the brink of extermination due to the high saline content) and the failure of the region’s rice farms due to the shorter season. As a result of these secondary effects the region is no longer able to sustain itself with its indigenous agriculture system and must depend on the import of basic food items.

Today, cotton farming is continuing to kill the region environmentally and even killing its people directly through pesticides and declining water quality. The crop’s profitability is preventing the governments from regulating the irrigation required to grow it, and the fertilizers and pesticides are polluting the soil and water systems. The simultaneous decline of water availability and increase in pesticide and fertilizer laden run-off has contributed to large increases in morbidity and mortality rates.¹⁹ DDT, a substance banded in the 1970s, was used extensively through the 1980s and is still used in some areas today. The historical and current use of DDT in the region has been so prevalent that every aquifer currently know in the region is contaminated. Locally available meats and fish, purchased at market, exceeds the safety norms of DDT contamination by 8 times and in fruits and vegetables by 16 times!²⁰

Further, in the Karakalpakia region of Uzbekistan DDT has been discovered in the milk of every nursing mother tested between 1990 to 1994 in such concentrations that

doctors have advised them against breast-feeding. Though this sounds like a simple solution, the problem became magnified when it was discovered that the locally produced infant formula contains DDT with increasing regularity. The problem does not appear to be going away anytime soon either. In the Andijan region along the Kazakstan and Uzbekistan border soil samples taken from 1989 through 1993 contained DDT in quantities up to 2,400 times the permissible level!

To see the strife caused by the degradation of the environment in the Central Asian region one only has to look to Uzbekistan. Just before the collapse of the Soviet Union ethnic tensions began to rise in Uzbekistan between its five primary groups (the Uzbeks, Russians, Tatars, Kazaks and Karakalpaks). Some of these tensions have diminished, but in the western part of the country the region of Karakalpakia, an area comprising about a third of Uzbekistan and the home of the Karakalpak minority, ethnic strife is increasing. The reasons behind this are many, but it is interesting to note that this region is the most contaminated area in the country, has the highest mortality rate and yet is the source of almost 70% of the country's mineral wealth and 40% of its agricultural output. Combine these factors with the drain of the region's wealth production to the Uzbek capital of Tashkent and minimal financial return to assist the ailing, and it is easy to see why the Karakalpak leaders are beginning to call for the independence that will most certainly lead to a civil war if left unchecked.

Once again, using Blackwell's three criteria of time, geographic priority, and connectivity we can trace the threat to national security that this environmental problem poses. Over "time" the Aral Sea basin's climate changes to the point where the region can no longer sustain itself agriculturally. This factor coupled with the contaminated

food stocks and the declining health of the people destabilizes the countries of Central Asia “geographic priority”. The connectivity is the Cold War related agricultural and industrial policies that still effect the region.

Working with the countries in the Aral Sea basin, NATO and the United States is pursuing the concept of preventive defense by participating in studies, extending valuable information about the problems associated with DDT and providing technology transfer solutions to clean up the contamination. NATO is also working with the countries of Central Asia to address the deforestation and desertification of the region. To date the exact level of future assistance has not been agreed to and the Uzbek problem with the Karakalpak’s have yet to be addressed on an international level, even though it could potentially destabilize the most populous country in the region.

Use of DOD Engineering Assets to Support Environmental Security in the CIS

In order to support a preventive mission to the CIS I turn to DOD’s engineering community, and in this case specifically to the theater level and corps level engineer brigades with assistance from the Corps of Engineers. These units can be found in both the active and reserve structure of the United States Army. Units such as these, with their moderate to large construction management cells that incorporate architects, engineers and construction managers excel in the design and installation of urban waste dumps, gravity sewer systems and sludge lagoon technology. These construction cells have the same capability of a fair size civilian design firm. Each of these strengths is a definite advantage to develop sustainable solutions to the problems mentioned in this paper for USAID believes that one of the two largest environmental problems in the CIS is the

disposal of solid waste.²¹ Further, these units can use their battalions and companies to perform nation assistance projects similar to what Southern Command is successfully doing today in Central and South America. Working beside host nation units and contract workers, these engineer brigades can not only train local forces so they can perform similar work on their own in the future, but learn so that applications can be improved.

Geographic environmental specialist Philip R. Pryde supports this view. In his book "Environmental Resources and Constraints in the Former Soviet Republics", he mentions that in Tbilisi, in the Republic of Georgia, regular garbage pickup stopped in 1993 when the hundred and twenty-year-old landfill became exhausted. Today, in the hills surrounding the city, refuse can be found cluttering large areas.²² This is an ideal and relatively easy engineer mission for the units I have mentioned and falls within the parameters of the preventive defense strategy outlined by Secretary Perry at the John F, Kennedy School.

Dr. Pryde further states in another portion of the book that like many of the former Soviet republics, Moldova has experienced wide-scale, intensive, and rapid deterioration of its river system due to point and non-point source discharge. During 1992, because of industrial, municipal, agricultural, and sanitary waste, 25 million m³ of untreated wastewater was discharged into the Dnestr basin.²³ Though more difficult than the Tbilisi problem, this project falls well within the strengths of the theater level brigades for design, and the combat heavy engineer battalions for construction.

Engineering units have the capacity to solve these problems as evident by the experience of the 194th Engineer Brigade. In 1990, the Tennessee National Guard was

approached by the Town of Penson, in Madison County, with a particular problem. The town needed a sewer system due to the rapid growth of the area and did not have the funds to design and build a new system. After a detailed legal review by DOD and the state Attorney General, and with a design grant from the State of Tennessee, the 194th Engineer Brigade, working with a civilian design firm, was tasked with the mission of designing and installing a city sludge lagoon disposal basin. The brigade designed the system in 1990, and its associated engineer battalion and separate companies installed the lagoon during the summers of 1991 and 1992.

The Penson project is on a much smaller scale than the Modovia problem. Still, the project is similar enough, as a solution set, to highlight the capabilities of this country's military engineer community to assist organizations such as USAID in its efforts to support the environmental security and preventive defense responsibilities of the United States. It additionally addresses the capability of the military engineer community to function as a tool of DOD in its effort to shape the republics of the CIS, their militaries through military-to-military contact, and thus prevent them from becoming failed states. It also points to the increase opportunities these units have to receive meaningful Mission Essential Task training that not only improves the unit's combat capability, but provides a proactive level of preventative defense.

For those project too massive for the engineer brigades, DOD also can leverage the civil works side of the U.S. Army Corps of Engineers. Within this portion of the command there are over 30,000 people who are heavily involved in the development of infrastructure and environmental solutions such as the remediation of toxic and hazardous material.²⁴ The technical competencies of this organization and its regional laboratories

have led to significant breakthroughs in our understanding of the environment and sustainable development. Further, the Corps of Engineers, in our country's history, was instrumental in the development of our infrastructure, the inter-coastal waterway system and many of the construction management techniques used by industry today. Much of what the CIS needs today are new trends that have been applied within the United States and are easily exportable to the realm of regional security in the form of a technology transfer.

Conclusion

This paper clearly highlights the linkage between the environment and national security. Developing nations will view environmental security in terms of human security, sustainable development and scarcity of resources. Developed countries will view the link between security and the environment in terms of global environmental changes and the potential for instability and conflict.²⁵ As these newly independent states struggle to establish separate identities and allegiances, they are faced with numerous challenges ranging from a resurgence of potentially violent nationalism, migrating populations that do not recognize artificial borders, to the need to deal with widespread environmental waste and its dangerous effects on its population and industry.

There is little the United States can do to check the spread of nationalism in this area of the world. Yet, there is much this country can do to support the development of effective national environmental policies and projects in the CIS, especially those that have been endorsed by the leaders and leading scientists in both this country and in the nations comprising the CIS. The Earth Summit conference provided the world with an

environmental framework for sustainable development and virtually every country agreed to the requirements spelled out in the accord. Using its agencies such as DOD, and USAID, and working with other organizations such as NATO, the United States has the tools to dampen the consequences of environmental degradation to preclude the outbreak of regional conflicts. This in turn can lead to trust and further into the future a potential global sustainability network that might work to the benefit of all nation-states.

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