

Strategy Research Project

Global Security Through Minimizing Food Loss and Food Waste

by

Colonel Rebecca I. Evans
United States Army

Under the Direction of:
Dr. Karen Finkenbinder



United States Army War College
Class of 2018

DISTRIBUTION STATEMENT: A

Approved for Public Release
Distribution is Unlimited

The views expressed herein are those of the author(s) and do not necessarily reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government. The U.S. Army War College is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

REPORT DOCUMENTATION PAGE			Form Approved--OMB No. 0704-0188		
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 01-04-2018		2. REPORT TYPE STRATEGY RESEARCH PROJECT		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE Global Security Through Minimizing Food Loss and Food Waste			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Colonel Rebecca I. Evans United States Army			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Dr. Karen Finkenbinder			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army War College, 122 Forbes Avenue, Carlisle, PA 17013			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution A: Approved for Public Release. Distribution is Unlimited. I understand this document will be included in a research database and available to the public. Author: <input checked="" type="checkbox"/>					
13. SUPPLEMENTARY NOTES Word Count: 6593					
14. ABSTRACT Food insecurity contributes to global insecurity, terrorism, and failed states making it a National and Global Security concern. Historical efforts focused on increasing production; however one third of food produced is not consumed due to post-harvest loss and waste. Increasing food safety concerns (intentional and unintentional contamination) limit developing nations' abilities to profit from international food sales. Landless farm workers account for tens of millions of the world's most food-insecure people. Instead of increasing food production, efforts in developing countries should focus on reducing food loss and waste and improving food safety. This approach will improve food access, create non-farm related jobs and improve potential income through exportation of foods that meet international safety standards. This Strategy Research Project reviews existing national Food Security programs in order to recommend ways to incorporate minimizing food loss and waste to improve food access in countries of national security interest. Opportunities to incorporate the Department of Defense (US Army Veterinary Services) into the whole-of-government Global Food Security Strategy will be explored.					
15. SUBJECT TERMS Food Security, Food Insecurity, Food Access					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 32	19a. NAME OF RESPONSIBLE PERSON
a. REPORT UU	b. ABSTRACT UU	c. THIS PAGE UU			19b. TELEPHONE NUMBER (w/ area code)

Global Security Through Minimizing Food Loss and Food Waste

(6593 words)

Abstract

Food insecurity contributes to global insecurity, terrorism, and failed states making it a National and Global Security concern. Historical efforts focused on increasing production; however one third of food produced is not consumed due to post-harvest loss and waste. Increasing food safety concerns (intentional and unintentional contamination) limit developing nations' abilities to profit from international food sales. Landless farm workers account for tens of millions of the world's most food-insecure people. Instead of increasing food production, efforts in developing countries should focus on reducing food loss and waste and improving food safety. This approach will improve food access, create non-farm related jobs and improve potential income through exportation of foods that meet international safety standards. This Strategy Research Project reviews existing national Food Security programs in order to recommend ways to incorporate minimizing food loss and waste to improve food access in countries of national security interest. Opportunities to incorporate the Department of Defense (US Army Veterinary Services) into the whole-of-government Global Food Security Strategy will be explored.

Global Security Through Minimizing Food Loss and Food Waste

Despite changes in administration, the United States National Security Strategy (NSS) over the last thirty years has remained focused on four core US National conceptual interests: 1) protection of US citizens at home and abroad, 2) encouragement of prosperity, 3) subscription to a rules-based international order and 4) promotion of American values.¹ Twenty-first century globalization revealed that the once clear divide between national and international interest became significantly blurred, with many international issues potentially impacting US national security strategic interests. One such issue is global food security.

According to the Food and Agriculture Organization of the United Nations (FAO), 815 million people worldwide are undernourished and around 836 million people live in extreme poverty.² The nexus of these two factors make affected populations extremely vulnerable to manipulation by corrupt governments, terrorism, and violent extremist organizations (VEOs).³ Consequently, global food insecurity threatens the protection of US citizens at home and abroad and incorporating food security in national strategy promotes American values.

Climate change is predicted to produce increasingly extreme weather events resulting in greater stress on critical environmental systems relevant to food production such as oceans, fresh water, and biodiversity.⁴ In addition, overuse and other human-induced changes have caused soil degradation (loss of productivity) to occur 40 times faster than soil formation. The potential impact of this soil exhaustion is significant, as ninety-five percent of the world's food supply is produced on a third of the world's soil.⁵ In combination, climate change and soil degradation is predicted to lead to increased incidence of crop failure, and the potential for food demand to outpace sustainable food

production.⁶ The subsequent supply-demand mismatch could lead to spikes in food prices, exasperating global food insecurity as those in the most need of food become the least able to afford it. In addition, with agriculture accounting for a fourth of the GDP in developing countries and eighty percent of the poor living in rural areas, climate induced agricultural failure will further destabilize these already struggling countries making them even more susceptible to manipulation by corrupt governments, terrorism and VEOs.⁷

The potential for competing world powers to use food security for their own national interests demonstrates another reason Global Food Security (GFS) is a US National Security Strategy (NSS) interest. China is very active in global food security, but their intentions often come under scrutiny, making review of their practices relevant to this discussion of the role of food security in US NSS, primarily as it applies to subscription to a rules-based international order. As a rapidly developing nation, China has significant food security concerns, specifically how to feed their growing population in the face of climatic change and dwindling natural resources.⁸ Over the last several years, China has risen as a leader in global food security, helping other developing nations improve agricultural practices through cooperative agricultural programs.⁹ As China's global food security assistance expands into strategically important parts of the world such as Africa and the South China Sea, the international community has begun to wonder whether their intentions are truly altruistic or if they are instead driven by the need to feed their own population and/or their desire to expand their influence to strategically important concerns of the world.¹⁰

Traditionally, efforts to combat food insecurity have focused on either providing food aid or working to assist nations in improving their agricultural development practices. Providing aid can be problematic as developing nations are susceptible to corruption which may lead to supplies falling into the wrong hands and the intended population never receiving the needed food products. In addition, food aid does not help the population develop methods or systems to sustain themselves, creating a cycle of dependency and a persistent state of vulnerability. Continuing to invest in agricultural development projects that focus exclusively on increasing production are equally problematic because they may have limited sustainability due to the above discussed climate and soil changes. In addition, there is questionable value in developing methods to produce more food when research shows that access to rather than production of food is the true issue.¹¹

Food security strategy for the 21st century requires a more holistic approach, one that shifts from increasing production and providing aid to one that focuses on improving access through reducing food loss and waste. Doing so will not only increase the quantity of available foods for local populations, but also the quality of the produced food products, improving the potential for these countries to attain economic stability through food export markets. In addition, refining post-harvest food handling will not only develop new job markets, but will create resiliency through job diversity. The end result will be improved access to food, increased economic and political stability and decreased vulnerability to VEOs and other government manipulation. In addition, helping rising world powers, such as China, resolve their food security issues by reducing their post-harvest food loss and waste may provide a non-threatening

mechanism to mitigate the potential to use global food security as a tool for gaining international reach, influence, and power.

This paper explains the importance of shifting food security strategy from increasing production to reducing food waste and loss. It starts with a review of food insecurity as a national security concern to include outlining the US Global Food Security Strategy and the role of key US government departments and agencies. It then introduces the concept of reducing food loss and waste as a more effective approach to combating food insecurity in a climatically and resource challenged environment. Next a review of existing national organizations and agencies with food loss and waste expertise will be conducted and recommendations for future approaches will be proposed.

Background

The United Nations Committee on World Food Security defines food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”.¹² The US Agency for International Development (USAID) further defines food security to exist when both physical and *economic* access to sufficient food exists. The US National Intelligence Council (NIC) adds to the definition, defining it as the “*perceived* and actual physical access to food supplies sufficient to meet the basic needs and preferences at every level- individual, community, state, and global”.¹³ This evolution of the definition provides insight to why global food security is a National Security concern, specifically, that increasing food insecurity, whether real or perceived, highlights inadequacy of government institutions and development assistance programs to support at-risk populations. This overall distrust of government leads to social disruption, large-scale political instability, and the potential

for subsequent violence and conflict.¹⁴ In addition, these vulnerable populations can become easy targets for VEO recruitment, and from a geopolitical view, complete state failure provides an environment where terrorism, violence, and international criminal activity can thrive.¹⁵

Food Security as a National and Global Security Issue

The situation in Maiduguri, Northern Nigeria and the establishment of VEO of Boko Haram, can serve as an example. Maiduguri's economy is largely agrarian, where 80% of the people depend on agriculture for their livelihood. In 2002, the radical Islamic sect, Boko Haram was founded by 32-year old Ustaz Mohammed Yusuf. Anchored on rejecting western education and influences as corrupting the way of Islam, membership in the sect was largely disaffected young people such as students who dropped out of the University of Maiduguri and unemployed graduates, all with deep seated grudges over the socio-economic and political conditions of their country. Boko Haram's rise to power as a regional threat may be attributed in part to their control of the food trade market of Gomboro. Serving as a depot for exportation of foods to Chad, Cameroon, Central African Republic, and Libya, control of the market impacts not only the local populous, but also food security across the Sahel region.¹⁶ According to the Center for Strategic and International Studies, VEOs such as Boko Haram have expanded an arc of instability from the Sahel region to West Africa, an area of strategic interest to the US and its allies.¹⁷ This clearly demonstrates the threat that food insecurity is to US National Security interests.

On the flip side, elections in Malawi demonstrate how food security policies can positively impact political outcomes. About 78% of the Malawian labor force works in agriculture, with a third of the nation's GDP being linked to the agricultural sector. In a

three year period the population suffered both devastating famine (2002) and then a devastating food crisis subsequent to failed harvests (2004). The newly elected (2004) president Mutharika, responded to the crisis by significantly changing food policies, specifically putting forth a program to subsidize fertilizers. In conjunction with renewed foreign aid from the World Bank and the UK Department for International Development, President Mutharika's government succeeded in stabilizing their national food security and in 2009 Mutharika won re-election by a landslide victory, the largest since its 1994 multiparty era.¹⁸ Although there is debate whether or not the success of his subsidy program sealed his re-election, there is no debate that the country's concerns over food security were one of the primary issues that influenced voter opinion. This demonstrates the positive impact successful food security programs can have on local, national, and potentially international politics and interests, further advocating for the continued inclusion of global food security in US national security strategy.

As introduced earlier, China appears to be acutely aware of the political role of global food security. In 2004 China became a net food importer and in 2013 its new food security strategy recognized imports not only as part of China's basic food security strategy but also as a way to ensure a dominant role for Chinese companies in the food supply chain.¹⁹ The magnitude of China's utilization of foreign exports has the potential to impact food prices and worsen the food insecurity status in many resource poor countries that rely largely on foreign imports for survival. The result could be instability on an international level and increased food prices worldwide.²⁰ In addition, China has exploited its technological expertise to invest in food development practices in other countries. For example, their many agricultural training centers throughout Africa

operate under the premise of providing Africa with essential agricultural skills in order to address African food security and economic concerns. However, the Sino-African agreements are written in a manner that protects China's economic and political interests such as financial gain and access to local markets.²¹ Similar programs exist in South East Asia, Russia, Australia, and Latin America.²² Together, these practices enable China's growing international power as it not only solves its own national food security issues, but it also establishes control over global food markets and gains access to critical land and economies of international partners. It is in the interest of US national security to prevent China from manipulating global food security strategy to further their advancement as a world power.

Current US Global Food Security Strategy

The US Global Food Security Act of 2016 (GFSA) states it is in the US national interest to promote global food security and resilience.²³ Specific objectives include self-sufficiency and economic freedom for food insecure countries, agricultural-led economic growth to reduce global poverty, hunger, and malnutrition, enhancing management practices and expanding access to local and international markets for small-scale producers, reducing reliance on emergency assistance (food shock resilience), and improved nutritional status for women and children.²⁴ Programs geared toward reducing post-harvest food loss and waste can impact all of these objectives.

The US Government Global Food Security Strategy: FY 2017-2021 was published in order to detail department and agency specific implementation plans in accordance with the GFSA. In all, eleven US agencies and organizations, ranging from the US Geological Survey to the US Department of Treasury submitted plans. The document emphasizes whole-of-government coordination, country and local ownership,

sustainability, partnerships, and innovation in science and technology, breaking the approach down to 3 strategic objectives of 1) inclusive and sustainable agricultural-led growth, 2) strengthened resilience among people and systems, and 3) a well-nourished population, especially women and children.²⁵ Once again, an approach to addressing all three objectives is to create programs to reduce post-harvest food loss and waste.

Importance of Focusing GFS Efforts on Minimizing Food Waste and Loss

The FAO describes food security as composed of four dimensions 1) food stability, 2) food utilization, 3) food availability, and 4) food access. Food stability refers to the resilience of a population's food security, its ability to sustain enough foods to support it despite sudden shocks such as economic or climatic events. Food utilization is a societal (non-food) dimension, referring to the population's practices as they relate to nutrient absorption such as adequate diet, clean water, sanitation and health care. Food availability refers to the quantity of foods available either through domestic production or imports (to include food aid). Food access refers to the ability of individuals to acquire foods in order to support their nutritional needs.²⁶

According to the US Intelligence Community Assessment (ICA) on global food security, as a whole, the world is likely to continue to produce sufficient food supplies for at least the next several years.²⁷ Unfortunately, it has been estimated that one third of food produced globally is not consumed due to loss and waste during postharvest handling and storage, processing, distribution, and consumption.²⁸ In addition, unemployed landless farm workers account for tens of millions of the world's most food-insecure people.²⁹ In addition to previous comments on the negative impact of climate change and decreasing productivity of natural resources, efforts to grow more food will not necessarily result in more food-secure countries. For all of these reasons, the ICA

proposes that improving food access through reducing post-harvest food waste and loss is the key to global food security.

Specifically, programs that focus on other than land-linked aspects of food production will create jobs for populations critical to national security, such as disenfranchised youth and unemployed young adults, both of which are susceptible to radicalization by violent extremist organizations, as demonstrated by the Maiduguri vignette. Empowerment through job security will make this population less susceptible to recruitment and will ultimately deny VEOs the ability to promote their terrorist agenda.

In addition, these new jobs may be particularly well suited for women, who make up 43% of the agricultural labor force in developing countries, but have disproportionately less access to land or financing. The creation of new nonfarm-wage job markets has the potential to significantly improve the chances of women to find jobs and be able to support themselves. Supporting women will lead to improved health of their children and subsequently improved health and productivity of the society as a whole.³⁰

Increasing concerns about the safety of foods (to include intentional and unintentional food contamination) have led to stricter international trade regulations. The resulting importation restrictions limit the ability of developing nations (especially vulnerable small-scale producers) to meet export requirements, diminishing their ability to profit from international food sales.³¹ Protecting the food supply generally falls into two categories: “food defense” refers to efforts to protect food against intentional contamination whereas efforts focusing on preventing unintentional contamination of products by agents reasonably likely to occur in the food supply are referred to as “food safety”.³² Programs that address food safety and food defense simultaneously address

food loss and waste. For example, ensuring the proper handling and monitoring of food products from production through processing, transportation, storage, delivery, and consumption (“farm to fork”) not only addresses food safety and defense concerns, it also minimizes food loss and waste. Helping vulnerable countries develop programs that address both food defense and food safety will pave the way for economic growth through export markets, while increasing the quality, quantity and security of food sources for local populations, while creating nonfarm-related job markets for the landless and otherwise vulnerable populations.

Lastly, there are documented trends in food consumption as nations, such as China, convert from “developing” to “developed”. Specifically, as populations grow they tend to move from rural to urban population centers.³³ This increases the importance of post-harvest food product management as it relates to getting foods from the area of production to the consumer. Investing in infrastructure such as roads and food storage warehouses and practices such as efficient and effective packaging for shipment becomes more important. In addition, as nations develop, their populations become more modern and diet preferences tend to change requiring update to traditional food handling practices.³⁴ Helping China resolve its food security issues by employing practices associated with reducing post-harvest food loss and waste may provide a non-threatening mechanism to mitigate their potential to use global food security as a tool for gaining international power.

US Agencies and Programs Food Loss and Waste

On July 20, 2016, President Obama signed into law the Global Food Security Act of 2016 (GFSA, P.L. 114-195). A key component of the act was to establish a comprehensive strategy to coordinate all US-funded global food security efforts.³⁵

US Agency for International Development (USAID)

The USAID is the lead federal agency in regards to the US government's (USG) global hunger and food security initiatives. Within USAID, the Bureau of Food Security (BFS) serves as the principle coordinator of national and international partner agencies. Specifically, the BFS, with the assistance of regional bureaus, provide country and regional offices with resources as well as technical and organizational leadership in order to implement food security programs within the guidance of the GFSS. The USAID "Feed the Future" campaign demonstrates the agency's bottom-up approach of working directly with countries to develop country-specific approaches to food security.

Broadly speaking, USAID aligns food security goals into three 3 fundamental objectives: 1) Inclusive and sustainable agriculture-led economic growth, 2) Strengthening resilience among people and systems, 3) A well-nourished population, especially women and children.³⁶ From improving agricultural-led economic growth by strengthening agricultural systems such as production, processing, storage, and transport to diversifying livelihood opportunities for landless and other marginalized populations (specifically women), USAID's concept for attaining global food security is superbly set to incorporate programs geared towards improving access by improving food access by reducing food loss and waste.

Of the multiple agencies and organizations listed as food security partners in the GFSS, the US Department of Agriculture is the best equipped to support initiatives and programs geared towards reducing food loss and waste.

US Department of Agriculture (USDA)

The USDA supports the GFSS with developmental programs that support international collaboration on agricultural research, promote information sharing, and

advance science-based policies and regulations regarding agricultural markets and trade. Emphasizing education, workforce development, and long-term beneficial impacts of food and agricultural sectors, the USDA helps to develop and sustain programs that make agriculture related production more competitive for developing nations.³⁷

Specifically, the USDA's Foreign Agricultural Service (FAS) leads USDA's efforts to help developing countries improve their agricultural systems and build their trade capacity. In addition to its Washington, D.C. staff, FAS has a global network of 93 offices covering 171 countries staffed by agricultural attachés and locally hired agricultural experts. These local teams identify country-specific problems and provide practical solutions in order to both support the local community and advance US foreign policy.³⁸

In addition, FAS hosts several educational programs geared developing international partners. The Cochran Fellowship Program provides hands on training in areas related to agricultural trade, agribusiness development, management, policy, and marketing. The Borlaug Fellowship Program aims to provide the scientific background for food security programs focusing on topics such as food safety and sanitation, natural resource management, and agricultural biotechnology as well as agricultural economics and related agricultural policy. By improving participants' understanding of agricultural science, the program helps foster science-based trade policies that improve international market access. The Food for Progress Program helps developing countries and emerging democracies modernize and strengthen their agricultural sectors by

training farmers in animal and plant health, improving farming methods, and developing road and utility systems.³⁹

As demonstrated above, the USDA possesses robust capabilities in regard to advancing global food security programs that reduce food loss and waste. However, there is another USG entity that has, to date, missed appropriate consideration. The below discussion will highlight the unique capabilities of the US Army Veterinary Services as it applies to US global food security strategy.

US Army Veterinary Services

The Army is the DOD Executive Agent for DOD Veterinary Public and Animal Health Services.⁴⁰ As such, the Army Veterinary Service is critical to US Global Food Security Strategy. The role of the Veterinary Corps Officer (VCO) in food security through supporting livestock livelihoods has already been covered in detail in other publications; therefore this paper will focus on the Army Veterinary Services' role in the food protection side of food security.⁴¹ Specifically, VCOs are charged with evaluating food protection processes that ensure food ingredients and products are safe, wholesome, meet quality standards, and are free from unintentional or intentional contamination.⁴² In support of this mission, the Veterinary Corps has not only accredited veterinarians but also warrant officers who have advanced food protection training from both military and civilian programs. Armed with extensive knowledge and experience in post-harvest food handling and equipped with very detailed regulations, protocols, and guides, these food protection specialists are superbly prepared to provide hands on support and subject matter expertise in regards to improving food access through reducing food loss and waste as it applies to the US GFSS.

In 2017, veterinary public health became one of the Secretary of Defense directed Global Health Engagement Activities for improving partner nation capabilities and capacities in support of USG national security and DOD strategic objectives.⁴³ In response, the Department of Veterinary Sciences (DVS) at the Army Medical Department Center and School (AMEDDC&S) began incorporating Global Veterinary Engagement (GVE) training in their curriculum. Geared at providing junior VCOs with an understanding of their role in America's national security, diplomatic, and development objectives, the course teaches how food security helps address the root causes of terrorism and instability in susceptible populations. The GVE training is in addition to the Veterinary Support to Stability Operations course and the Assessment and Production Systems Course already offered to VCOs deploying in support of Stability Operations.⁴⁴

Veterinary Corps Officers serve in a multitude of positions throughout the world and across the DOD. Geographic Combatant Commanders (GCC) possess veterinary capabilities in their traditional non-deployable and deployable units as well as in their regionally aligned Special Forces units. Engagement strategies include military-to-military (mil-to-mil), military-to-civilian (mil-to-civ), and military-to-military-to-civilian (mil-to-mil-to-civ).

The work between the Southern Command (SOUTHCOM) command veterinarian and the Chilean Veterinary Service demonstrates a recent example of a mil-to-mil engagement. Discussing food protection programs, norms, and standards the team worked to improve veterinary operational readiness and Chilean Food Protection capability and capacity in order to increase awareness of public health issues and develop partnership opportunities in the SOUTHCOM area of operation. The

collaborative event had the added benefit of helping the team formulate a plan to mitigate foodborne risks during an upcoming combined Peace Keeping Operations (PKO) in the Central African Republic.⁴⁵

To date, the majority of veterinary mil-civ and mil-mil-civ engagements have occurred with Special Forces units, specifically Civil Affairs (CA) units where veterinary assets are organically assigned. For example, the 95th CA Brigade veterinarian played a key role in the Civil Affairs Operations that occurred in the Barh-el-Gazel region of Chad, Africa in March 2017. Geared towards identifying and mitigating civil vulnerabilities that could be leveraged by violent extremist organizations, the Civil Military Support Element Lake Chad Basin East (CMSE LCB-E) partnered with local US Department of State and USAID representatives and the Chadian Special Anti-Terrorism Group Action Civilo Militaire (SATG ACM) to provide a platform for traditional leaders to express their grievances and concerns with the regional administration and national government. In support of this effort the brigade veterinarian helped the SATG ACM plan and execute a Veterinary Outreach event that, for the first time, joined the Ministry of Livestock and Agriculture with the Ministry of Defense in support of national interests.⁴⁶

In May of 2017, the 91st CA battalion veterinarian led the Civil Military Support Element Burkina Faso (CMSE BFA) collaboration with the Ministry of Animal Resources (MRAH) by conducting a symposia series that improved food security for women by improving small ruminant production practices. Building on already established partnerships with the MRAH and supporting USAID and Burkinabe national objectives of empowering women, the symposia addressed specific concerns from women such as

preventing rather than reacting to disease and managing the economic vulnerability of cyclic dairy goat milk production. The whole-of-government approach developed a network of host nation and USG professional and government partners invested in the female-centric program, ensuring not only the livelihood of this vulnerable population, but also the health of their families, and the food security of the nation.⁴⁷

The critical role of these rural engagements in stabilizing agrarian societies susceptible to VEOs spurred the creation of an 80 hour Special Warfare Rural Engagement and Mapping Course (SWREMC). Geared towards Special Operations Forces (SOF), the two week course teaches participants to understand the intricacies of rural agriculture systems and the culture of agrarian societies in order to identify both potential vulnerabilities and future partnership opportunities. Created and taught by a combination of civilian agricultural specialists, USG agencies, and DOD subject matter experts, to include VCOs, the course teaches a whole-of-government approach to simultaneously meeting host nation needs, building USG legitimacy, and achieving country and Theatre Special Operations Command (TSOC) objectives.⁴⁸

These events, although focused on livestock livelihoods rather than reducing food loss and waste, demonstrate the powerful influence of VCOs in facilitating stabilization in agricultural societies, specifically as it applies to nations at risk of VEOs. Incorporating the food protection skills of the VCO in these programs would have even wider reaching impacts, by not only providing job security to landless workers but also work that is resilient to climate change and dwindling natural resources.

Food Security and National Defense Authorization Act 2018

On 12 December 2017, President Trump signed the National Defense Authorization Act (NDAA) for Fiscal Year 2018. Two sections of the act specifically

address the importance of food security to US national security. Section 335 directs investigating the projected impact of climate change on DOD operations over the next 20 years to include instability resulting from food demands exceeding supplies in countries important to our national security interests.⁴⁹ Section 1075 explicitly directs an assessment of DOD policies and Operational Plans for addressing the national security implications of global food system vulnerabilities. Of particular interest is DOD's plan to address food system vulnerabilities that contribute to major state conflicts, civil wars, insurgencies, and terrorism. Included in the plan should be an evaluation of US, ally, and strategic partner interests as well as potential military operations in regions where food system instability represents an urgent and growing threat. In addition, plans should include opportunities for cooperative military-to-military relationships in order to build partner capacity and avoid, minimize, or control global and regional food system shocks and the undesired sequel.⁵⁰

Gaps in Current Global Food Security Strategy

The DOD is not listed as a partner agency in the US GFSS. Although it claims to have a whole-of-government approach and lists eleven agency-specific implementation plans, there is no mention of the Department of Defense. In the summer of 2017, one year after the initial passing of the GFSA, the Stimson Center held the first of a series of round table discussions regarding this oversight.⁵¹ Aiming to discuss the current status and future role of civil-military engagements in regards to the GSFA, a group of over 50 experts representing DOS, USAID, DOD, US Department of Commerce, and a variety of non-governmental and academic institutions came together. Unfortunately, the majority of the discussions about potential military contribution to food security programs centered on non-food related capabilities such as technological surveillance

systems (climate, population movement), conflict prevention practices in the field, and conveying instability intelligence from military on the ground to the food security *implementing agencies*.⁵² Although the military was praised for being quick to reestablish order during natural disasters, it was clear participants felt it was the role of *civilian aid agencies* to provide food support to victims.⁵³ Statements like these disregard the food-related technical expertise that exists in the military, minimalizing the DOD's involvement to the classical role of shaping the battle field. This sentiment is further supported with the statement that "NGOs spend a lot of time and resources within local communities, assessing the extent of aid needed; the mere presence of the military often disrupts this process".⁵⁴

Not all in attendance marginalized the potential technical contribution of the military. In fact, the summary document from the first meeting mentioned the agricultural expertise that exists in the National Guard state-partnership programs and Civil Affairs Farm Assessment and Evaluation Training program. In addition, there was a brief mention of Regional Combatant Commands having the capability of assessing food and climate as part of their overall regional planning efforts in support of US and national security objectives.⁵⁵

The above outlines key challenges to a true inter-agency approach to food security. Although all participants agree to the importance of food security in national security, differences in organizational culture, communication, and practices in conjunction with misperceptions about technical capabilities and skills have prevented a true whole-of-government approach. Meetings and discussions through 'think-tank' organizations like the Stimson Center are a great start to resolving our stovepipe

thinking; however it is critical that we have the correct stakeholders, such as senior VCOs, at the table. Overlooking the outstanding food protection capabilities of the DOD VCO demonstrates a critical flaw in the US GFSS, one that we cannot afford to overlook in the future.

With the signing of NDAA 18, the DOD has officially been pulled into the Global and National Security scene. Hopefully, along with the direction to act will come the subsequent budgetary considerations which may be the olive branch leaf needed to bridge the gap between DOS and DOD food strategy plans.

In addition, despite the widely accepted understanding that climate change and dwindling natural resources will increasingly limit the sustainability of efforts to increase agricultural production, the majority of international food security programs continue to focus on the production aspect of food security. As discussed above, shifting program focus to improving access through minimizing food loss and waste not only improves availability of foods to local populations, it also provides landless workers with employment, and increases the potential for countries to enter international trade markets. The overall impact of these programs is farther reaching than continuing to invest in farm-based approaches as it provides economic and societal stability in regions historically susceptible to manipulation by VEOs. In addition, programs that focus on reducing food loss and waste through post-harvest system management can greatly benefit near peer counties like China navigate their food security concerns. Investing in Sino-American programs that focus on this approach may provide viable options to their current strategy of investing abroad, thereby discouraging their potential to use global food security as a tool for gain international power.

The tools to support this shift in focus already exist. With the USAID as the lead, USDA and US Army VCOs as technical subject matter experts, what is needed now is a collaborative effort to make the changes happen.

Recommendations

In order to ensure a more effective national effort in combating global food security, the US government must truly embrace a whole-of-government approach that formally includes Department of Defense expertise, specifically the technical skills and capabilities of the US Army Veterinary Corps Officer. In addition, to have a sustainable impact, efforts must shift from increasing food production to improving food access through creating systems to minimize food loss and waste. There are three main ways to accomplish these changes: incorporate VCOs in strategic level military planning activities, adapt existing training programs to highlight the critical role of reducing food loss and waste, and, formally include US Army Veterinary Services in US global food security strategy planning.

In order for GCCs to fully incorporate food security in defense planning scenarios, operational plans, theater cooperation plans, and Unified Command Plans, as directed in the NDAA 18, the DOD needs to assign VCOs to strategically important planning billets. Currently, the highest level that a Staff Veterinarian can serve in a GCC is at the Army Service component level. In addition, the majority of these Staff Veterinarians work in the Surgeon cell as public health/force health protection officers. In this position their food protection advice is generally limited to that of the US Armed Forces food supply. Although this is an admittedly important aspect of our national security, placement in the Surgeon cell limits their ability to contribute to critical planning activities such as Theater Security Cooperation. In order to fully meet the intent of the

NDAAs the GCC Staff Veterinarian should serve in the J5 future planning section where they can identify opportunities for collaboration with international partners in order to address concerns over global and regional food security. The US Army Special Operations Command recognizes and acknowledges the critical role of VCOs in their organization and is looking to add authorizations to the J3/5/7 plans and operations cells of all five Theater Special Operations Commands (TSOCs).⁵⁶ Hopefully the continued emphasis on global food security, as outlined in the 2018 NDAA, will help prioritize resources in order to make these plans a reality.

As education is a critical method for both shifting focus to post-harvest food security strategies and incorporating Army Veterinarians in the whole-of-government approach to global food security strategy, the remaining two recommendations will be discussed somewhat concurrently.

There are multiple educational platforms already in existence that can be used to promote focusing food security training on increasing access by minimizing food loss and waste. AMEDD C&S is in charge of providing food protection training to its junior VCOs. With the inclusion of veterinary services in the GHE initiative, AMEDD C&S Department of VS adapted its training to incorporate the application of the VCO skillset to national security goals. Still a program in its infancy, the Department of VS should invest time and resources into expanding their training to further highlight how the VCOs' food protection skills can be used to address global food security concerns, specifically as it applies to reducing post-harvest food loss and waste. In order to ensure its officers understand the importance of a whole-of-government approach, interagency partners such as representatives from the DOS, USAID and USDA (FAS) should be

invited to participate in not only the teaching of the course, but also in attending the course. This inclusive approach would ensure VCOs understand, at an early stage in their careers, the relationship that exists between the DOD and interagency partners as it applies to foreign engagements. It would also have the added benefit of ensuring our non-DOD USG partners understand the vital skillset US Army VCOs can bring to the food security 'fight'.

As VCOs progress in their careers they are required to attend specialization Long Term Health Education Training (LTHET) training. Most officers receive their training at established universities where they can specialize in clinical veterinary medicine, veterinary pathology, laboratory medicine, or veterinary preventive medicine/public health. In order to foster interagency collaboration and improve the USG's ability to address our nation's global food security concerns, the US Army Veterinary Corps should investigate opportunities for VCOs to meet their LTHET requirement through internships/fellowship programs with our interagency partners. For example, time spent with the USDA could have tremendous benefits as it would not only provide skills for our VCOs to utilize in foreign engagements, but also knowledge and experiences they can apply to protecting the DOD food supply. Of particular interest is VCO participation in the multiple FAS hosted fellowship and internship programs. The USDA, too, would benefit from the experience, as hosting VCOs would provide a better understanding of our capabilities and mission. In addition, developing an internship-like program with USAID could be extremely valuable as it would not only expose participating VCOs with a better understanding of the USG's global food security strategy from a non-DOD point

of view, but it would also provide USAID with a better understanding of the DOD's food security capabilities.

In order to fully ensure the success of the US GFSS, the whole-of-government approach must expand to include the Department of Defense, specifically the US Army Veterinary Services. The round table sessions currently hosted by the Stimson Center are a critical first step in this process, as they highlight several areas that must be addressed in order to make this a reality. First and foremost is a lack of common understanding about DOD food security capabilities, specifically the food protection skills of the VCO. One obvious way to overcome this gap is to invite senior VCOs to the round table meetings. Having VCO representation would not only provide participants a better understanding of the DOD's food protection capabilities, but it would also allow senior veterinary leaders to better understand the concerns of the non-DOD food security community. These honest discussions can decipher misunderstandings from true issues, in order to develop a common operating picture for global food security strategies of the future.

As discussed in detail earlier, there are multiple examples of successful collaboration between the DOD and USG. Unfortunately, it would appear these successes are not filtering up to strategic leaders and have therefore not informed unified policy or strategy. There needs to be a way for these experiences to be captured and shared with both military and non-military leadership in order to establish best practices and inform future strategy. One approach is to invite participants of successful whole-of-government activities involving VCOs to participate in the Stimson Center round table discussions. Having them show-case their lessons-learned could prove

valuable in both demonstrating the critical skills of VCOs in food security and in alleviating concerns about incorporating the military in global food security strategy.

Other options for information sharing may include but are not limited to establishing a central repository for global food security partnership programs, creating unclassified newsletters for global food security partners, and holding interagency conferences and or forums. Understanding the sensitive nature of some of the outreach activities, content may be limited on details, but valuable lessons learned should still be shared. It is recommended that these topics are raised at the next Stimson Center roundtable discussion.

Conclusion

Every four years, made to correspond with advising new presidential administrations, the US National Intelligence Council (NIC) publishes strategic assessment of how key trends and uncertainties might shape the world over the next 20 years.⁵⁷ In January 2017, the NIC report warned that climate change, increasingly severe weather events, and soil depletion would exasperate food insecurity in countries of national security interest.⁵⁸ As food insecurity is a known contributor to global insecurity, the Trump administration responded by incorporating specific wording on food security in both its National Security Strategy and its National Defense Authorization Act. In particular, the NDAA charged the DOD with developing strategies to incorporate global food security in their strategic plans.

Due to the predicted impact of climate change and resource depletion, the NIC recommends expanding global food security programs from increasing production to decreasing losses through post-harvest food loss and waste. Although the DOD, through the US Army Veterinary Officer Corps, has subject matter expertise in

managing post-harvest food processing, the DOD is not listed as one of the partner agencies in the current US Global Food Security Strategy.

In order to ensure the success of the US GFSS, and in compliance with President Trump's NSS and NDAA, the nation's global food strategy must fully embrace a whole-of-government approach, one that incorporates the US Army Veterinary Corps Officer as a strategic planner and tactical participant. In addition, existing global food strategies should adjust to incorporate programs geared towards reducing food loss and waste during post-harvest processes. By increasing coordination and collaboration across US government organizations and partners the US GFSS can fully realize its intended purpose of promoting stability in countries of US national security interest.

Endnotes

¹ Ronald Reagan, *National Security Strategy* (Washington, DC: The White House, January 1988), 6; George H.W. Bush, *National Security Strategy of the United States* (Washington, DC: The White House, August 1991), 10-11; William J. Clinton, *A National Security Strategy for Engagement and Enlargement* (Washington, DC: The White House, February 1995), 10-11; William J. Clinton, *A National Security Strategy for a New Century* (Washington, DC: The White House, October 1998), 7; George W. Bush, *The National Security Strategy for the United States of America* (Washington, DC: The White House, September 2002), 10; Barack Obama, *National Security Strategy* (Washington, DC: The White House, February 2015), 2.; Donald J. Trump, *National Security Strategy of the United States* (Washington, DC: The White House, December 2017), 4.

² Food and Agriculture Organization of the United Nations, "Sustainable Development Goals," <http://www.fao.org/sustainable-development-goals/> (accessed December 1, 2017).

³ Jamey Essex, "From the Global Food Crisis to the Age of Austerity: The Anxious Geopolitics of Global Food Security," *Geopolitics*, 19, no. 2 (2014): 266-290, <https://doi.org/10.1080/14650045.2014.896795> (accessed December 1, 2017).

⁴ United States National Intelligence Council, *Global Trends Paradox of Progress*, NIC 2017-001 (Washington, DC: US National Intelligence Council, January 2017), 21, <https://www.dni.gov/files/documents/nic/GT-Full-Report.pdf> (accessed November 20, 2017).

⁵ *Ibid.*, 24.

⁶ United Kingdom Ministry of Defense, *Strategic Trends Programme: Global Strategic Trends- Out to 2045*, (Ministry of Defense UK, Crown Copyright, June 2014), 28-29,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/348164/20140821_DCDC_GST_5_Web_Secured.pdf (accessed November 20, 2017).

⁷ Food and Agriculture Organization of the United Nations, “Sustainable Development Goals.”

⁸ Bishwajit Ghose, “Food Security and Food Self-Sufficiency in China: From Past to 2050,” *Food and Energy Security*, 3, no. 2 (2014): 86-95, <http://onlinelibrary.wiley.com/doi/10.1002/fes3.48/full> (accessed November 19, 2017).

⁹ Food and Agriculture Organization of the United Nations, “Country Programming Framework 2012-2015 for People’s Republic of China,” (December 2012), <http://www.fao.org/3/a-ax529e.pdf> (accessed 13 November 2017); Food and Agriculture Organization of the United Nations, “China and FAO, Partnering for sustainable domestic and global food security,” (2015) <http://www.fao.org/3/a-au075e.pdf> (accessed November 13, 2017).

¹⁰ Isaac Lawther, “Why African Countries Are Interested in Building Agricultural Partnerships with China: lessons from Rwanda and Uganda,” *Third World Quarterly*, 38, no. 10 (2017): 2312-2329, <http://www.tandfonline.com/doi/full/10.1080/01436597.2017.1333889> (accessed November 10, 2017).

¹¹ United States National Intelligence Council, *Global Trends Paradox of Progress*, iii.

¹² Committee on World Food Security, “Making a Difference in Food Security and Nutrition”, <http://www.fao.org/cfs/home/about/en/> (accessed December 2, 2017).

¹³ Office of the Director for National Intelligence, *Intelligence Community Assessment-Global Food Security* (Washington DC: Office of the Director for National Intelligence, September 22, 2015), https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/Global_Food_Security_ICA.pdf (accessed November 10, 2017).

¹⁴ Ibid.

¹⁵ Essex, “From the Global Food Crisis to the Age of Austerity: The Anxious Geopolitics of Global Food Security,” 275.

¹⁶ Bosede Awodola and Agyeno Oboshi, “Terrorism in Northern Nigeria: A Threat to Food Security in Maiduguri,” *Mediterranean Journal of Social Sciences*, 6, no. 352 (May 2015): 11-17, <http://www.mcser.org/journal/index.php/mjss/article/view/6455/6188> (accessed November 27, 2017).

¹⁷ Jennifer G. Cooke, Thomas M. Sanderson, Caleb J. Johnson, *Military and the Arc of Instability: Violent Extremism in the Sahel* (Washington DC: Center for Strategic and International Studies, Transnational Threats Project and the CSIS Africa Program, September 2016), <https://www.csis.org/analysis/militancy-and-arc-instability> (accessed November 29, 2017).

¹⁸ Andrew Mabvuto Mpesi and Rgnhild L. Muriaas, “Food Security as a Political Issue: the 2009 elections in Malawi,” *Journal of Contemporary African Studies*, 30, no.3 (2012): 377-393, <https://doi.org/10.1080/02589001.2012.689624> (accessed November 20, 2017).

¹⁹ Jiayi Zhou, "China and (World) Food Security," *Stockholm International Peace Research Institute*, (16 Oct 2016), <https://www.sipri.org/commentary/blog/2016/china-and-world-food-security> (accessed November 20, 2017); Bishwajit, "Food security and Food Self-Sufficiency in China: From Past To 2050," 86-95.

²⁰ Bishwajit, "Food Security and Food Self-Sufficiency in China: From Past to 2050", 86-95.

²¹ Lawther, "Why African Countries Are Interested In Building Agricultural Partnerships With China: Lessons from Rwanda and Uganda," 2312-2329.

²² Zhou, "China and (World) Food Security".

²³ *Global Food Security Act of 2016*, Public Law 114-195, 114th Cong., (July 20, 2016), 130 STAT. 675, <https://www.congress.gov/bill/114th-congress/senate-bill/1252> (accessed November 20, 2017).

²⁴ Ibid.

²⁵ Obama, *US Government Global Food Security Strategy*, iii.

²⁶ Food and Agriculture Organization of the United Nations, *Food Security Policy Brief*, Issue no. 2, (June 2006), <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf> (accessed December 5, 2017).

²⁷ Office of the Director for National Intelligence, *Intelligence Community Assessment-Global Food Security*.

²⁸ Jenny Gustavsson, et al., *Global Food Losses and Food Waste. Extent, Causes and Prevention*, (Rome, Italy: Food and Agriculture Organization of the United Nations, 2011) <http://www.fao.org/docrep/014/mb060e/mb060e00.pdf> (accessed November 10, 2017).

²⁹ Office of the Director for National Intelligence, *Intelligence Community Assessment-Global Food Security*.

³⁰ Obama, *US Government Global Food Security Strategy*, iii.

³¹ Office of the Director for National Intelligence, *Intelligence Community Assessment-Global Food Security*.

³² Benesh Deann L., "The Food Safety Modernization Act- A Series for a Food Professional to Know," *Food Protection Trends*, (May-June 2013): 158 <https://www.foodprotection.org/resources/food-safety-modernization-act/downloads/2013-03-fsma-article-3.pdf> (accessed November 20, 2017).

³³ United States National Intelligence Council, *Global Trends Paradox of Progress*, 8.

³⁴ Office of the Director for National Intelligence, *Intelligence Community Assessment-Global Food Security*, Annex C.

³⁵ *Global Food Security Act of 2016*, Public Law 114-195, 114th Congress.

³⁶ Obama, *US Government Global Food Security Strategy*, iii.

³⁷ Ibid., 63-67.

³⁸ The US Department of Agriculture Home Page, “Programs,” <https://www.fas.usda.gov/programs> (accessed December 13, 2017).

³⁹ Ibid.

⁴⁰ Undersecretary of Defense Personnel & Readiness, *DoD Veterinary Public and Animal Health Services*, Department of Defense Directive 6400.04e (Washington, DC: Undersecretary of Defense Personnel & Readiness, June 27, 2013) <http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/640004e.pdf> (accessed December 13, 2017).

⁴¹ Anne E. Hessinger, *Reducing Conflict and Increasing Stability Through Livestock Based Livelihoods*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, April 1, 2017).

⁴² Undersecretary of Defense Personnel & Readiness, *DoD Veterinary Public and Animal Health Services*, 5.

⁴³ Undersecretary of Defense Policy, *Global Health Engagement (GHE) Activities*, Department of Defense Instruction 2000.30 (Washington, DC: Undersecretary of Defense Policy, July 12, 2017), 12, http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/200030_dodi_2017.pdf (accessed November 29, 2017).

⁴⁴ Matthew Levin and Paul Hollier, “Global Veterinary Engagements: Operationalizing a New Directive,” *US Army Veterinary Services News Notes*, 6 June 2016, 15-16.

⁴⁵ Matthew Levin, Chief, Food Protection Branch, Army Medical Department Center and School, Department of Veterinary Science, “SMEE with Chilean Military,” unclassified Executive Summary brief, 11 October 2017.

⁴⁶ Dale Bebee, U.S. Army Special Operations Command, Command Veterinarian, “Flintlock 2017,” unclassified Executive Summary brief, 10 October 2017.

⁴⁷ Dale Bebee, U.S. Army Special Operations Command, Command Veterinarian, “Women’s Empowerment,” unclassified Executive Summary brief, 10 October 2017.

⁴⁸ Dale Bebee, U.S. Army Special Operations Command, Command Veterinarian, “Special Warfare Rural Engagement and Mapping Course,” White Paper, 10 October 2017.

⁴⁹ Trump, *National Defense Authorization Act Fiscal Year 2018*, 165-170.

⁵⁰ Ibid., 761-763.

⁵¹ The Henry L. Stimson Center and Schar School of Policy and Government, *Roundtable Summary In Defense of Food Security: Understanding the Intersection of Food Security and National Security in a Turbulent World*, (George Mason University: The Henry L. Stimson Center and Schar School of Policy and Government, July 2017).

⁵² Ibid.

⁵³ The Henry L. Stimson Center and Schar School of Policy and Government, *Roundtable Summary In Defense of Food Security*, 1.

⁵⁴ Ibid., 2.

⁵⁵ The Henry L. Stimson Center and Schar School of Policy and Government, *Roundtable Summary In Defense of Food Security*

⁵⁶ Dale Beebe, U.S. Army Special Operations Command, Command Veterinarian, e-mail message to author, 10 October 2017.

⁵⁷ “National Intelligence Council-Global Trends,” from the Office of the Director of National Intelligence home page, https://www.dni.gov/index.php?option=com_content&view=article&id=398&Itemid=776 (accessed 23 December, 2017).

⁵⁸ United States National Intelligence Council, *Global Trends Paradox of Progress*, 21.