

AC 2009-1524: AFRICOM AND THE CORPS OF ENGINEERS: HELMETS VS. HARD HATS

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AFRICOM and the Corps of Engineers

Helmets .vs. Hardhats

Abstract

Service learning projects in developing communities, offer an opportunity for students to gain a full appreciation for the cultural and political limitations that engineers face when providing technical support to developing nations. To satisfy the project requirement for the Civil and Infrastructure Engineering MS program at George Mason University, one student took on the daunting task of developing a framework for the US Army Corps of Engineers to provide civil works expertise to desperately needy areas of rural Africa. Africa is a vast continent with over 900 million people in 53 countries and it accounts for approximately 14% of the world's population. Only 64% of the African population has access to improved water supply. Only 60% have any type of sanitation coverage. The situation is even more dire in rural areas. Africa has the lowest water supply and sanitation coverage in the world. These are the more discussed difficulties that lead to dangerous health situations and destabilization of an area. Yet, in 2000, large floods hit southern Africa, killing thousands of people and leaving 850,000 people homeless. Both droughts and flood have increased in frequency and severity over the past 30 years. There is widespread erosion and flooding along the African coastline, uprooting human settlements, dislodging port and navigational facilities, and upsetting coastal fisheries. With some of the poorest countries and harshest living conditions in the world, Africa's strategic importance has always been debated. However, recent history shows that "sustainable peace requires economic development". Many now recognize that peace and stability (or lack of) on the continent impact not only Africans but the international community. What should be done? In response in February 2007, the Department of Defense (DOD) created the United States Africa Command (AFRICOM) whose overall mission is to "promote a stable and secure African environment". It should be noted that the creation of AFRICOM has been met with mixed reviews. Some African nations have reservations so at this time DOD has decided that the AFRICOM headquarters will be situated in Germany instead of Africa. Questions still remain - What will promote stability and security in the current African environment? Can the Corps' Civil Works expertise encourage sustainable development? How can an engineering workforce enhance stability in Africa? This paper describes a service learning project completed by a graduate environmental engineering student. Enhancing stability on the continent of Africa proved to be personally satisfying and professionally challenging. The faculty adviser and student learning objectives are presented and Liechardt scores for the accomplishment of each objective are shown. Results showed that although the project was challenging, the student persisted and benefitted personally and professionally.

Objective

The MS program in Civil and Infrastructure Engineering at George Mason University requires students to complete a project or thesis related to their field of study. Many students find a service learning project to be of greater interest and personal satisfaction.

Such projects may simply satisfy the requirements for the MS degree. An increasing number of students are investigating service learning opportunities that enable them to continue service beyond their MS degree. This paper investigates one such graduate project in which a student employed by the U.S. Army Corps of Engineers (USACE), Civil Works (Corps) developed a framework to support the United States Africa Command (AFRICOM) mission. AFRICOM seeks to enhance the stability on the continent of Africa. With some of the poorest countries and harshest living conditions in the world, AFRICOM has the potential of making a significant impact on the lives of hundreds of thousands of rural Africans in desperate need of reliable water resources and sanitation services. The objective of the student project was to perform a needs assessment of AFRICOM followed by an evaluation of the strengths and resources of USACE to support the identified needs. Additionally, an objective of this work was to identify potential sponsors for the work. The personal objective of the student was to develop a framework that could be adopted by USACE in the support of the AFRICOM program. This paper will detail the project and lessons learned in the accomplishment of the stated objectives of this service learning opportunity.

Background

AFRICOM is a United States Unified Combatant Command whose area of responsibility is the continent of Africa (excluding Egypt). A unified combatant command is an organization composed of forces from two or more of the armed services and has a broad continuing mission. Before the creation of AFRICOM, U.S. military involvement in Africa was divided among three commands (Europe, Central and Pacific Commands). Due to recent events policymakers felt a more focused strategic approach was needed for Africa and there was a concern that with three commands coordination would be challenging. In February 2007, the Bush Administration announced the creation of a new unified combatant command for the continent of Africa because of its emerging strategic importance. AFRICOM was declared operational on 1 October 2008. (Figure 1)

AFRICOM

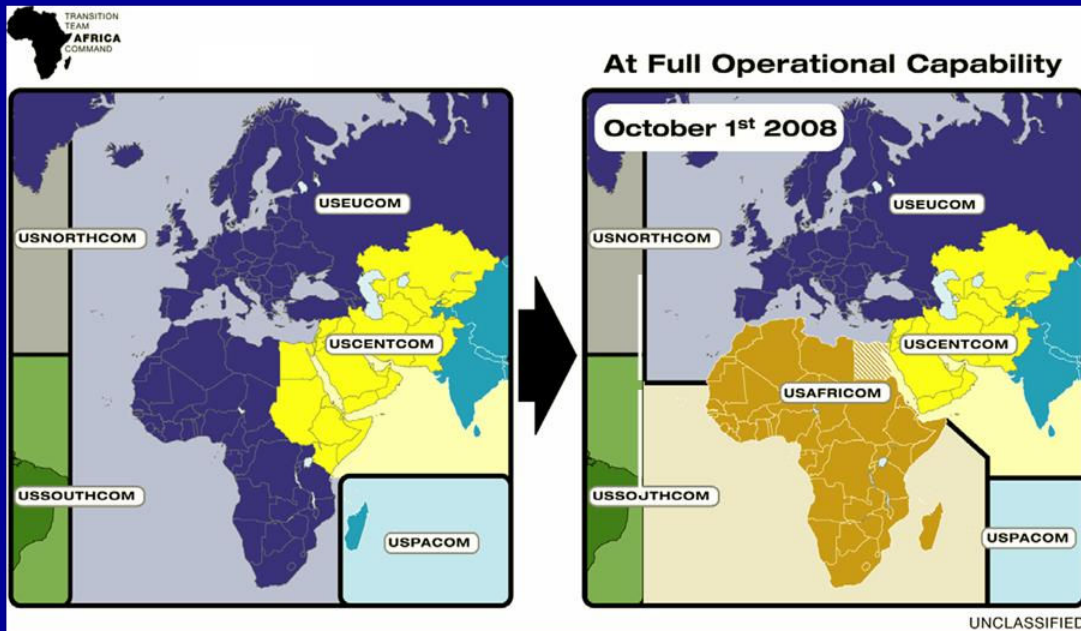


Figure 1. AFRICOM Area of Responsibility (*CRS Report for Congress*)

As stated earlier, AFRICOM is a combatant command and has all the traditional responsibilities associated with military operations. However, AFRICOM has also been given a “soft power” mandate which concentrates on building a stable environment with the help of a civilian component. The civilian component includes but is not limited to the African partner(s) and other government agencies. Department of Defense (DOD) officials explain that the defense strategy is evolving from “fighting and winning wars” to preventing conflict by addressing threats at their onset. AFRICOM’s proactive approach seeks to “help develop a stable environment in which civil society can be built and that the quality of life for the citizenry can be improved.”¹ As foreign policy expert J. Peter Pham explains, AFRICOM will “require a major break with the conventional doctrinal mentalities both within the armed services themselves and between government agencies.”² AFRICOM, known as a combatant command “plus”, will be the hands-on model for an evolving DOD strategy.

Africa’s rise in strategic importance is based on several factors but instability on the continent poses a major threat. The DOD believes that instability poses a major threat to the U.S. as indicated by the 2008 National Defense Strategy, “the inability of many states to police themselves effectively or to work with their neighbors to ensure regional security represents a challenge to the international system” and that “if left unchecked,

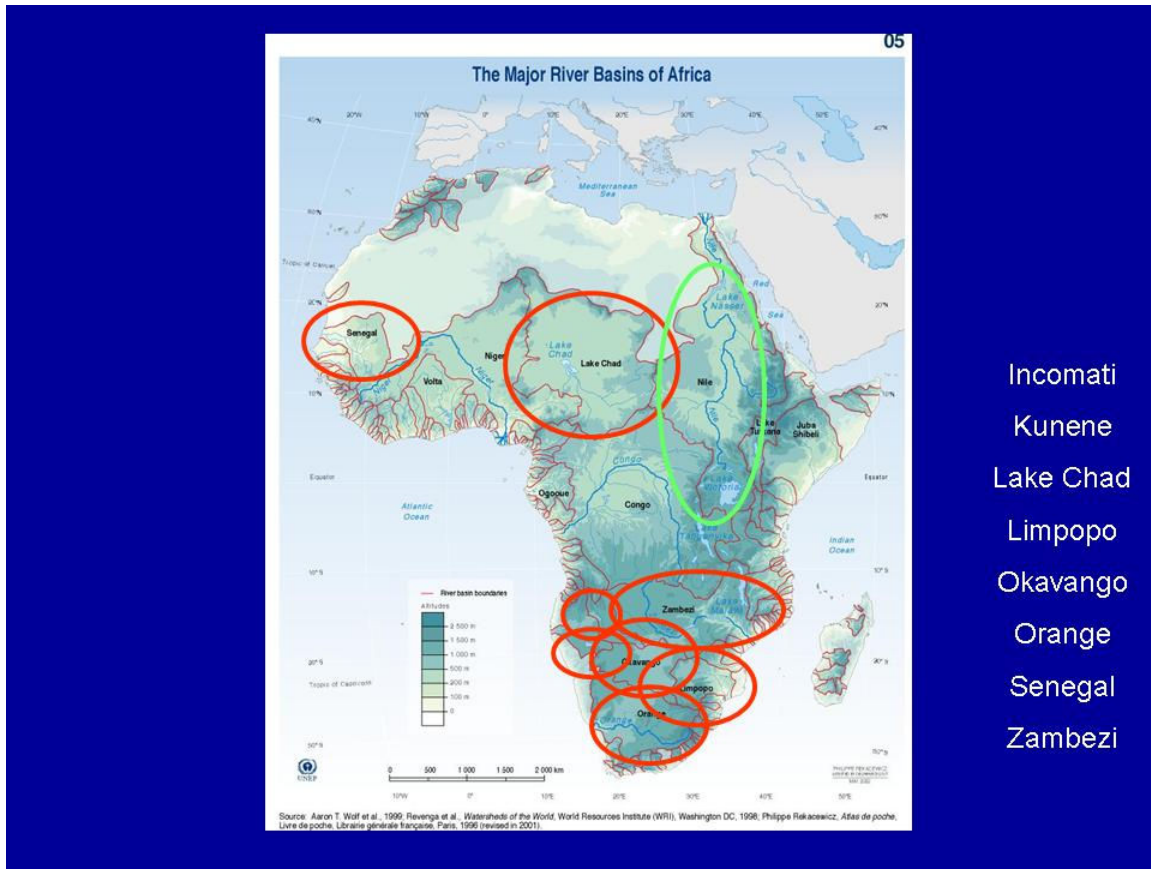


Figure 3. African Basins at Risk

Promoting a stable environment

To promote a stable environment you must secure water resources through development and management. Water resources have always played a central role in the basic survival and development of societies. Achieving water security, “harnessing the productive potential of water and limiting its destructive impacts”, is and always will be a priority.⁶ As a society develops, its success will depend on how well it develops the constructive aspects of water to support human health, agriculture, transportation and energy. Success further depends on how well the society manages the destructive aspects of water such as floods, droughts and disease. A society must invest in both water resource infrastructure and institutions in order to harness the constructive and destructive aspects of water.

A study of the investment in water infrastructure in Japan was completed in 2005. The results verified that “intensive investment in water infrastructure since the establishment of Japan as a modern state particularly in postwar years, has enabled: securing national land safety, sanitation improvement and expansion of water supply service, which contributed to the rapid socio economic growth.”⁷ Figure 4 illustrates how the investment in water infrastructure and institutions relates to the water security and growth. There is a tipping point or minimum platform of investment shown on the hypothetical water and

growth curve indicating that societies below this point can be vulnerable to water impacts.

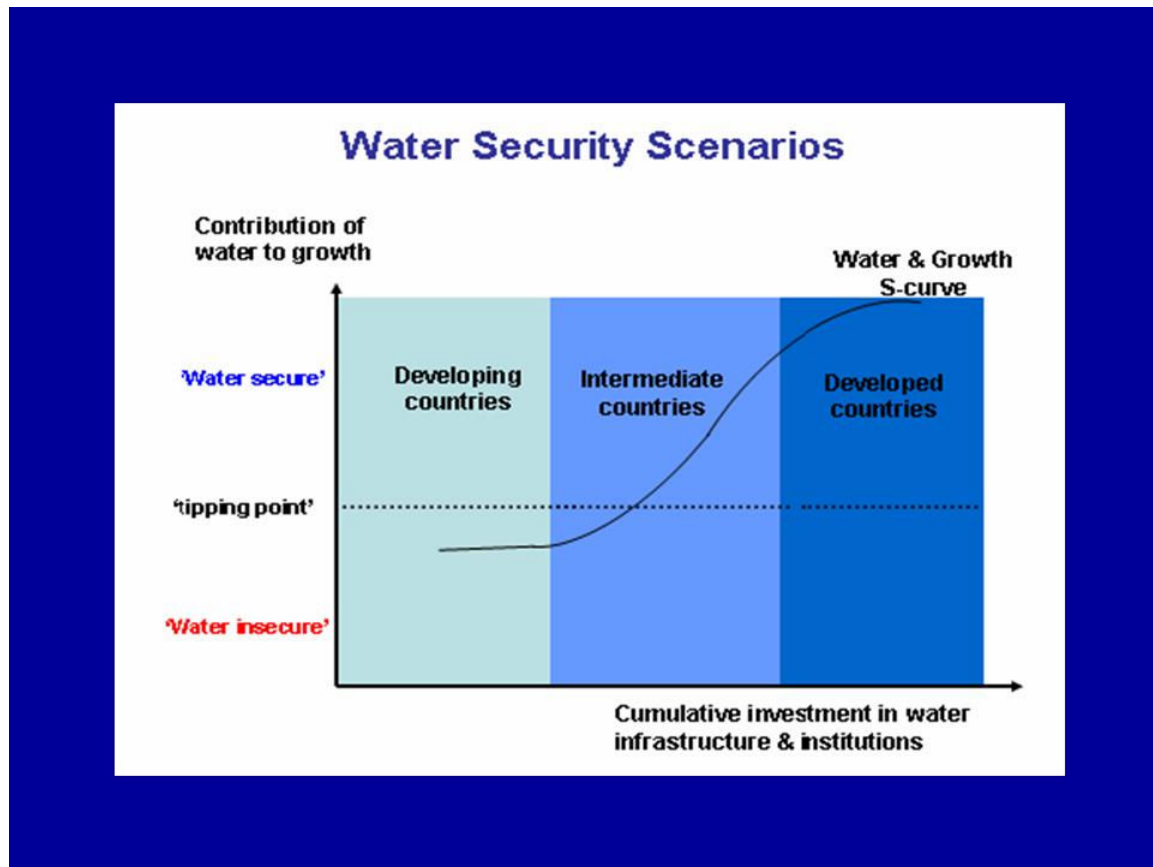


Figure 4. Water infrastructure and institution investment and tipping point for economic growth (*Japan Water Forum*)

The continent of Africa can not be categorized into one scenario. Each of the 53 countries of Africa will have their own characteristics and will fall somewhere into one of these three broad categories. Developed countries fall along the water secure segment of the curve. Characteristics of developed countries are: (1) large investment in water infrastructure, (2) most major rivers or bodies of water are managed (ie providing reliable clean water, storing water, reducing peak flows, protecting water quality), (3) water management institutions exist and are usually part of the government, (4) mature infrastructure platform, and (5) emphasis on water management and infrastructure operations. These countries have successfully “harnessed hydrology” and experienced broad base growth and development.

Intermediate countries usually fall along the tipping point segment. Characteristics of countries “hampered by hydrology” are: (1) industrializing economies, (2) large investments in water infrastructure, and (3) inadequate institutional and human capacity to manage resources. These countries are seeking the proper balance and sequencing of infrastructure and institutional investments.

Developing countries fall along the water insecure segment of the curve. Characteristics of countries “hostage to hydrology” are: (1) least developed economies, (2) extreme variability in rainfall (floods/droughts), (3) very limited water related investments, and (4) inadequate water resources infrastructure and institutions. In these countries, growth is closely linked to rainfall and they become “hostage to hydrology”.

Common areas of interest

One impediment to the AFRICOM mission has been the identification of common interests between USACE, the AU and sponsors. Local needs, USACE capabilities and sponsor goals must converge for successful projects to be developed. Determining these objectives has been a major impediment in the AFRICAM mission. The Corps workforce of approximately 34,600 civilian and 650 military members can provide engineering and construction services, environmental restoration and management services, research and development assistance, management of water and land related natural resources, relief and recovery work, and other management and technical services. This diverse workforce includes: biologist, engineers, geologist, hydrologists, natural resources managers and many others whose expertise would be potentially useful for the AFRICOM mission. A detailed review of USACE capabilities yielded the following list suitable for AFRICOM programs and projects.

- Capacity Development - training to increase host nation or regional organization capabilities in all types of professional engineering, construction management, contract management, project management; water resources and environmental planning and management; conflict management focused on natural resources; and, disaster management. Corps can help create engineering organizations within Africa.
- Technical Advice - advice on any kind of infrastructure, water resources or environmental problem. Corps can also review project proposals and plans to see if they are sound, implementable and sustainable.
- Planning - develop plans for infrastructure improvements necessary for economic development. This could include comprehensive river basin studies to assist countries in the sustainable development of their water resources. River transportation to move commerce, hydro-electricity to provide renewable energy, and water storage for flood control and water supply can help Africa move to economic prosperity.
- Construction - assist African countries in the construction of projects big or small or can handle complete project implementation using African or international firms.
- Networking – assist in partnering with a wide variety of agencies and organizations with an interest in helping Africa.

For this project, local interests included the African Union countries and water resources agencies. Their needs range from unity among African countries to environmental preservation. Potential sponsors identified were the DOS, USAID, Millennium Challenge Corporation (MCC), World Bank, and The Nature Conservancy (TNC). Their goals range from eradicating poverty, to reducing child mortality, to agricultural development, to habitat conservation. (Figure 5)

The goals of potential sponsors can be sorted into four major categories: Human Health and Justice, Water Security, Regional-Economic Development and Environmental Sustainability. An evaluation of the Corps' Capabilities, Sponsor Goals and Local Needs resulted in the mutual areas: Water Security and Environmental Sustainability. (Figure 6)



Figure 5. Capabilities/Goals/Needs

	Areas of Interest	Corps Capabilities	Sponsor Goals	Local Needs
Human Health and Justice	Improve maternal health		X	
	Combat HIV/AIDS		X	X
	Eradicate poverty/hunger		X	X
	Provide primary education		X	X
	Empower women		X	
	Reduce child mortality		X	
	Malaria/tuberculosis		X	X
	Women's justice		X	
	Human rights		X	X
	Gender issues		X	
	Refugees		X	X
	Land mines			X
	Weapons			X
	Emergency response	X		X
Water Security	Climate change	X	X	X
	Droughts	X	X	X
	Floods	X	X	X
	Hydropower	X	X	X
Regional-Economic Development	Develop global partnerships	X	X	
	Job creation		X	X
	Agriculture		X	X
	Food prices		X	
	Debt crisis			X
	Social/Economic Growth		X	X
	Democracy		X	X
	Political Stability/development		X	X
	Unity/interstates			X
Environmental Stewardship	Rid continent of apartheid			X
	Ensure environmental sustainability	X	X	X
	Protect environmental diversity	X	X	X

Figure 6. Mutual Areas of Interest

For countries that may have “harnessed hydrology”, the Corps can provide assistance in re-engineering the existing infrastructure system to optimize performance or meet evolving environmental priorities. For countries that are possibly “hampered by hydrology”, the Corps can provide assistance by conducting comprehensive river basin studies to develop water resources infrastructure and assist in development of water management institutions. For countries that are “hostage to hydrology”, the Corps can provide humanitarian assistance when requested.

The following key authorities, available to the Corps, can be used to provide assistance and support to foreign governments and international organizations, as relates to the AFRICOM mission:

1. Section 607 of the Foreign Assistance Act of 1961 (22 USC 2357) authorizes the President of the United States to furnish services and commodities on an advance-of-funds or reimbursable basis to friendly countries, international organizations, the American Red Cross, and voluntary nonprofit-relief agencies registered with

- and approved by the U.S. Agency for International Development, when the President determines it is in furtherance of the goals of the Act.
2. Section 632a and 632b of the Foreign Assistance Act of 1961 (22 USC 2392) authorizes the President of the United States to allocate or transfer funds to any U.S. Government agency, including advances by any country or international organization for the procurement of commodities, defense articles, military education/training or services. Section 632b provides the authority for any U.S. Government official carrying out functions under this Act may utilize said services from any other U.S. Government agency as the President shall direct, or with the consent of the head of such agency.
 3. Section 234, Water Resources Development Act of 1999 (33USC 2323a) authorizes the Secretary of the Army to engage in activities in support of other federal agencies or international organizations to address problems of national significance to the United States. The Secretary may use USACE technical and managerial expertise to address domestic and international problems related to water resources, infrastructure development, and environmental protection. Section 234 also authorizes some appropriated funding to use in providing support.

The Framework

The Corps, sponsors and local entities must participate as partners in the development and management of Africa's water and related resources. The quality and success of the partnerships will be based on mutual respect, integrity, cooperation, and flexibility. A project or activity will evolve from an idea/goal to solve a problem/need that is in all the partners' best interest and will require significant cooperation. The following process (Figure 7) was developed to support AFICOM projects/activities.

- Identify a goal/need (Sponsor/Local Interest)
 - Sponsor and/or Local Interest identify a goal/need that is beyond their ability to solve.
- Coordinate with Corps
 - Sponsor, Local Interest and Corps determine if Corps has capability/authority to address goal/need.
- Request for Assistance submitted to Corps (Sponsor/Local Interest)
 - Projects originate with a request from a sponsor or local interest.
- Prepare detailed Scope of Work and cost estimate (Corps/Sponsor/Local Interest)
 - Partners will coordinate and agree upon scopes of work.
- Provide funds (Sponsor/Local Interest)
 - Funds will be provided prior to initiating work.
- Execute a Contract for Services (Sponsor/DOS)
 - Contract can be a Memorandum of Agreement, Letter of Acceptance or Memorandum of Understanding etc.
- Perform Work (Corps)
 - Corps will perform work mutually agreed to in contract/SOW.
- Perform Operations and Maintenance (Local Interest)

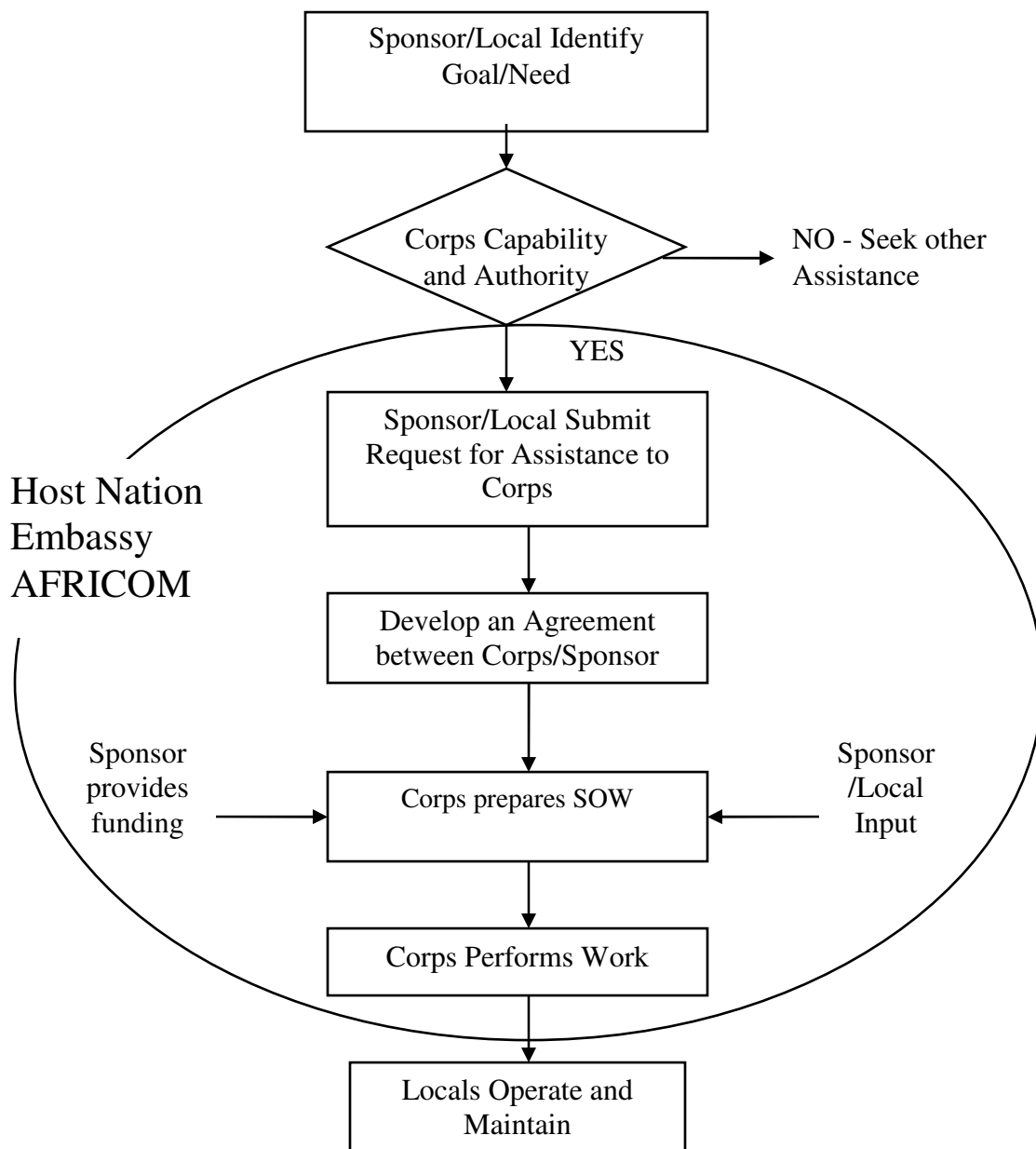


Figure 7. AFICOM/USACE Framework

The framework shown in Figure 7 can provide guidance to a local authority seeking assistance. It defines the areas of responsibility and indicates the processes that require action and input. The real work is at the beginning and the very end of the process. At the beginning the Corps, sponsor, and local interests must align their goals, capabilities and needs to develop and apply innovative approaches to solving the needs. (Figure 6) The identification of a technically sound solution to a specific problem/need is only one factor that must be incorporated into the development process. Great attention must be given to cultural, social, political and other factors in order to provide an acceptable

solution. To insure that the project is well maintained, the local interest must be given the tools and training necessary for successful independent operation.

International Guidance

Interviews were conducted with Corps employees who have been deployed and other professionals who have volunteered in Africa. A summary of the findings from the survey is as follows:

Capacity development capabilities for host countries is essential. Host country capabilities will vary significantly from countries with unskilled labor to others with engineering expertise. Relying on host country contractors may not be an acceptable solution. If the host country has no expertise, contractors may need to be hired from outside the country which will increase costs and may cause other problems with the local authorities. Careful negotiation is required. Similarly, involving representatives from the host country in the decision process will improve the acceptance of the contract team.

Operation and maintenance of the project. Once the Corps completes the project, the local interest must operate and maintain it. In many undeveloped countries there is no systematic way to perform the operation or maintenance of infrastructure systems. The institutions needed to oversee operations or provide maintenance may not be able to provide/program the funds to do either over time. The project must address the entire lifecycle of the infrastructure investment and additional time for O&M planning must be allocated.

Supplies/Materials. Whenever possible, adapt the project to utilize local materials. This improves the local economy and supports sustainability goals. In the case of small projects, the only logical solution may be to bring parts and materials. The supply of goods and materials must be thoroughly investigated prior to the project implementation.

Logistics. Transporting personnel, materials and supplies to the project site requires careful planning. Roads, highways and airfields may be shown on local maps, however these facilities but may be in disrepair or non-existent. A backup plan is needed in the event of problems.

Security. Security must be of a primary consideration. Security issues can also affect contractors hired by the Corps.

Corruption. In some countries, bribery is a socially acceptable and necessary part of doing business.

Cultural awareness. To be culturally aware, one must be culturally smart. Study cultural aspects of the project region. For example, the color red has a strong negative connotation in Madagascar. Use of the color red in drawings and text is not acceptable. In Central African countries like Nigeria, acceptable distance between people of the same

sex is much less than in the United States. The day of rest in Muslim countries is Friday. Work will not be performed on those days.

Lessons Learned

Multiple learning objectives were identified for this service learning effort. The faculty adviser and the student developed objectives for the service learning project. The first two some cases the objectives were mutually agreed and in other cases the objectives reflected the personal goals of the faculty or student. Using a Leichardt Scale, the faculty and the student indicated the accomplishment of their objectives. In addition to the objectives, the faculty adviser reviewed the difficulty in accomplishing the stated objectives as compared with other projects of a non-service learning nature. The assigned scores are shown in the following table. Scores are not listed for objectives that were not mutually shared between the faculty adviser and student.

Table 1. Accomplishment of Learning Objectives

Learning Objective	Objective Difficulty	Objective Attainment	
		Student	Faculty
Apply civil engineering knowledge to the solution of a complex problem under constraint	4	4	4
Develop a sustainable solution that is environmentally sound, economically viable and socially responsible	4	4	4.5
Presentation of results in a seminar or conference	4	4	4
Preparation of a conference or journal article suitable for publication	5	3	4
Produce a solution that benefits USACE	4.5	4	4
Produce a solution that benefits the needy in Africa	5	3	
Personal feeling of accomplishment	4	5	
Personal feeling of satisfaction	4	5	
Professionally challenging	5	5	
<p>Difficulty Scale</p> <ul style="list-style-type: none"> 1 – Requires little to no knowledge and effort to accomplish 2 – Requires minimal knowledge and effort to accomplish 3 – Requires a moderate knowledge and effort to accomplish 4 – Requires significant knowledge and effort to accomplish 5 – Objective requires advanced knowledge and effort to accomplish <p>Accomplishment Scale</p> <ul style="list-style-type: none"> 1 – Did not accomplish the stated objective 2 – Unsatisfactory accomplishment of the stated objective 3 – Partial accomplishment of the stated objective 4 – Accomplishment of the stated objective 5 – Exceeded the expectations of the stated objective 			

The assessment shows that although the level of difficulty in accomplishment of the objectives was significant, the student met most of the requirements. The notable exceptions were the preparation of a conference or journal article (partially accomplished, needed considerable guidance from faculty) and the production of a solution that benefits the needy in Africa (she felt that the program needed to be executed before she would consider it a success). The technical nature of this project was not exceptionally difficult, however there were significant obstacles to the completion of this project. In theory, service projects involving large organizations with multiple talents offer the potential to make significant contributions in desperately needy areas of the world. USACE is a large, complex organization. Identifying the requirements of the project was difficult because of the need to coordinate with many managers and units within USACE. Finding a solution to satisfy USACE, the sponsors and the needs of the African countries was very difficult. The desire to assist the people of Africa inspired this student to persevere in spite of the difficulties. All environmental MS projects at GMU are required to accomplish the first three objectives. Despite tremendous obstacles, both logistical and programmatic, the personal benefits associated with the service learning nature of the AFRICOM project, more than compensated for the additional work needed to ensure success.

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Footnotes

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