The Problem:
In developing countries, insufficient human-resource capacity related to water, sanitation, and hygiene (WASH) and environmental issues remains one of the most significant barriers to providing effective and sustainable services. In most developing countries, there are large, experienced international nongovernmental organizations (NGOs) that operate in the WASH sector, but the local field staff often lack the necessary technical human-resource capacity to effectively implement WASH interventions. To help NGOs and governments address these human-resource capacity needs, the Desert Research Institute (DRI), Drexel University, and the University of Nevada, Reno (UNR), are collaborating to provide technical capacity training and action research to field staff across Africa through a series of competency-based training modules.

The Program:
DRI and Drexel courses are offered for credit and are taught in the field as well as online. There are two certificate tracks for the program: International WASH at DRI/UNR and Public Health (Global WASH) at Drexel University. Initially, DRI/UNR will offer a certificate program, but earned credits can be applied toward a bachelor’s, master’s, or PhD degree in International WASH if students want to pursue one of those programs. DRI/UNR courses in the program are:

1) International Water, Sanitation, and Hygiene (I-WASH)
2) Project Development and Management for WASH Managers and Leaders (WASH-PDM)
3) WASH Field Methods (WASH FM)
4) Crosscutting Issues in WASH (CCI-WASH)
5) Water Supplies and Environmental Management in Developing Countries (WSEM)
6) WASH Policy, Communications, and Advocacy (WASH-PCA)
7) WASH Action Research in Developing Countries (WASH-AR)

Other courses that are being developed are:
- Market-based Approaches to WASH
- Long-term Sustainability of WASH Services
- Sustainable Development Goals and WASH
- Integrated Water Resources Management in Developing Countries
- Water Safety Planning

Course Descriptions:

1) International Water, Sanitation, and Hygiene (I-WASH):
This is a 3-credit undergraduate/graduate course. The goal of the course is to discuss the global, scientific, engineering, health, socioeconomic, and programmatic issues of WASH in developing countries. Students will gain an understanding of the scope and magnitude of the global WASH crisis. The course will cover various low-cost and appropriate technology options; successful sanitation, hygiene, and behavioral change frameworks; water-related diseases; and chemical toxicity. The course will also cover how these aspects affect human health in remote villages. We will examine the past and current socioeconomic and political strategies that have been applied to provide sustainable WASH services to rural populations. We will then discuss important WASH issues, including sustainability challenges, and case studies using examples from Africa, Asia, and Latin America. Students will acquire global perspectives about WASH and be qualified to make significant contributions to their local WASH programs and the global WASH sector.

2) Project Development and Management for WASH Managers and Leaders: (WASH-PDM)
This is a 3-credit undergraduate/graduate course. WASH is a multidisciplinary field, which can make it challenging to find professionals with the diverse skills needed to effectively supervise or manage WASH programs. Most large NGOs that undertake multisectoral programming have some WASH programs that fall under managers without adequate experience to manage such complex, multidisciplinary projects. The main goal of this course is to provide competency-based training for staff that manage or have line responsibility for WASH projects in developing countries. Increased field staff capacity will lead to improved stakeholder engagement and WASH program design, implementation, monitoring, and evaluation for the long-term sustainability of WASH services. Ultimately, these improvements will result in more cost-effective and sustainable WASH programs that provide long-term benefits for millions of people throughout the developing world.
3) **WASH Field Methods (WASH FM)**
This is a 3-credit undergraduate/graduate course. Developing countries often have insufficient technical human-resource capacity to locate, develop, and manage drinking water sources in a sustainable way. Additionally, WASH professionals in developing countries lack the skills to gather and analyze data and use the results to enhance the development of future water systems. In most sub-Saharan Africa countries, locating sites for viable water-resource development is difficult because the occurrence of water in the underlying geological/geographic terrain is minimal. The main objective of this course is to familiarize students with field methods from environmental sciences that are applicable to the WASH sector in developing countries. This senior undergraduate/graduate level course covers applying geography, hydrogeology, surface water, water chemistry, field surveying, geographic information systems (GIS), and data management techniques to developing drinking water sources. Students will acquire skills in critical analysis, field methods, and reporting. This is a time-intensive course that challenges students to learn both in the classroom and in the field.

4) **Crosscutting Issues in WASH CCI-WASH**
This is a 3-credit undergraduate/graduate course. WASH service provision is integral to overall human well-being and is closely connected to many other development sectors. Access to WASH is a basic human right and lack of access is detrimental to economic productivity, childhood survival, public health, education, environmental conservation, climate resilience, and much more. Poor sanitation negatively affects water quality and ecosystems. However, WASH projects provide small-scale irrigation opportunities to cultivate high-value crops, which improves nutrition at home and increases household income. Effective WASH can also contribute to improving educational outcomes and future employment opportunities in developing countries, especially for women and girls, as well as reduce maternal deaths and malnutrition.

Although WASH interventions are sometimes conducted in isolation, this course will make the case for integration across sectors to ensure human well-being. Water serves as the fundamental link between the climate system, human society, and the environment. Climate change is severely affecting the hydrological cycle, and consequently water management. This will in turn have significant effects on human development and security (UN Water, 2010). Using research and case studies in developing countries, the course will conclude with discussions about the various WASH stakeholders and their responsibilities for integrating and/or collaborating with other sectoral actors. Students will prepare and present a research paper to the class.

5) **Water Supplies and Environmental Management in Developing Countries (WSEM)**
This is a 3-credit graduate course. Water resources and environmental management around the world are significant issues for the global WASH sector because of increased water demand, floods, and climate change. New and innovative approaches that are economical and effective are essential to sustainable WASH services. Developing knowledge and skills to better understand these challenges and how to plan and manage limited resources is critical. This graduate level course will provide students the knowledge and expertise necessary to effectively manage water and environmental resources in developing countries. The course will focus on the conditions and aspirations of communities in low- and middle-income countries. Students will understand the principles and practice of water and environmental management for public good, which will equip them with the appropriate expertise and skills to work in developing countries. The course includes broad areas of hydrology (both surface and groundwater), natural systems (lakes and rivers), soil-plant interactions in the context of water, flood management, and sustainable management.

6) **WASH Policy, Communications, and Advocacy (WASH PCA)**
This is a 3-credit graduate course. Lack of political prioritization of WASH is one of several barriers to providing effective and sustainable services. The momentum for advocacy has grown significantly with the introduction of the Millennium Development Goals (MDGs) in 2000. Throughout the world, advocacy with national-level government officials and decision makers has led to the creation and implementation of WASH policies and increases in budget allocations. The main goal of this graduate level course is to provide a framework for effective ways to advocate for WASH policies and practices in developing countries.

The course will begin with the basic definitions of policy, communications, and advocacy; the history of WASH advocacy around the world, including the creation of the MDGs and the Sustainable Development Goals (SDGs); the use of WASH scientific and engineering data and evidence for advocacy; and a snapshot of global advocacy successes. The course will then cover current advocacy initiatives at the global, United States, European, and developing country levels and outline a framework for applying strategic advocacy to WASH service delivery programs in developing countries. Students will be able to identify the role advocacy can play in advancing WASH service delivery, the diverse forms of advocacy and the effect of each, and how to map the policy and budget climate to assess the most appropriate approach for their advocacy work. Through case studies, students will study the common elements of effective advocacy that can be used to drive policies and budgets for sustainable WASH services across the developing world. The course will conclude with the future of WASH advocacy and how students can advance WASH service delivery by integrating advocacy into their current work. Students will prepare and present an advocacy strategy to the class.