

### TEAM Malawi (Technology-Education-Advocacy-Medicine Malawi): A Multidisciplinary Global Health Experience

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**Program/Project Purpose:** Among faculty and students, there is increasing demand for global engagement experiences. In 2013, one physician from the Virginia Tech Carilion School of Medicine (VTCSoM) and two students from Virginia Tech (VT) engineering conducted a community based participatory research (CBPR) project in water, sanitation and hygiene (WASH) and a needs assessment for medical devices in Malawi. In 2014, two physicians and three students returned to Malawi to share prototypes of seven devices with 100 healthcare providers at eight hospitals. Over the next two years, multiple projects were launched regarding medical device and WASH solutions, while collaborations blossomed with the local global health community.

**Structure/Method/Design:** In 2015, faculty and students from VT, Radford University (RU), and VTCSoM formed the multidisciplinary TEAM Malawi with a Community Wellness model of healthcare as its central theme. Three groups went to Malawi in 2016, each with a distinct focus. *Teaching and Learning in Malawi* was a combination of education, engineering, and medical students and faculty. *Experience WASH* permitted students to participate in applied research, field trips, small group activities, and classroom lectures. *Service-Learning Through Engineering Design* engaged VT students through community-based participatory design of WASH and medical technology.

**Outcome & Evaluation:** Four faculty and six students participated in *Teaching and Learning*, resulting in collaborations with hospitals and schools in Zomba, with the ministry of health, and NGOs for research, education, and service. Four medical devices were introduced via CBPR. *Experience WASH* involved 15 US and 8 Malawian students, and 2 US and 1 Malawian faculty for a course at Mzuzu University. Three tracks were completed, including Fish Contamination in the Market Supply Chain, Hygiene and Sanitation Assessment of Public Sites, and Mapping WASH Services in a Community. The *Service-Learning* group consisted of one undergraduate, one graduate student, and one faculty from VT. They introduced a pit latrine desludging system, a water well digging system, and a medical device to colleagues at the University of Malawi-Polytechnic.

**Going Forward:** This multi-institutional, multidisciplinary approach, coupled with CBPR centered about a community wellness model, has resulted in a growing program with the potential to produce sustainable TEAM change in Malawi.

**Source of Funding:** Virginia Tech College of Engineering; Virginia Tech Carilion School of Medicine; Pediatric Medical Device Institute.

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### Palm Oil in Myanmar: A Spatiotemporal Study of How Industrial Farming Affects Biodiversity Loss and the Sustainable Diet

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**Background:** Palm oil consumption is not only potentially deleterious to human health, but its production has resulted in 11 million hectares of deforestation globally. Palm oil development and consumption in Myanmar is a burgeoning and under-researched phenomenon. Importing roughly 394,000 metric tons of palm oil in 2012 alone, the Burmese government has recently pushed for intensive palm oil development to sate domestic demand for consumption and become international market players. Given well-studied linkages between biodiversity loss and ecosystem instability, this study aims to characterize the nature of deforestation for palm oil production in Myanmar, its effects on the 'sustainable diet', and what factors influence it.

**Methods:** First, a GIS land suitability analysis overlaying spatial data on rainfall, elevation, and slope was conducted in order to identify areas of Myanmar best suited to palm oil tree growth. Second, after narrowing the geographic range, vegetation indices using varying spectral band models in ENVI (specifically, bands 3, 2, 1; 4, 5, 1; and 5, 4, 3) allowed a more granular examination of vegetation phenology over the past 30 years. Lastly, ground-truthing permitted an in-person verification of GIS and ENVI results and provided contextual understanding of palm oil development in Myanmar.

**Findings:** GIS analysis reveals that the Tanintharyi region, one of the most biodiverse regions in Myanmar, proves best suited to palm oil growth. Next, Vegetation indices reveal a rapid shift from small-holder farming to what appears to be industrial palm oil plantations all throughout Tanintharyi. Ground-truthing suggests that plantations are indeed becoming fully industrial, encourage construction of massive processing plants like the Yuzana plant 15km north of Maliwan, and accompany an apparent local embracing of the industrial activity.

**Interpretation:** If these trends of palm oil intensification continue, then four key outcomes may follow: (1) even higher levels of biodiversity loss, (2) increased access and affordability of edible palm oil, (3) decreased importing of palm oil, and (4) large profits made from selling excess palm oil on the international market. Although the first two may most affect low-income Burmese populations, the latter two may bode well for the domestic economy and international trade partners, thus encouraging competing interests.

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### What has Changed as a Result of Having Access to Water in Rural Communities in Gaza, Mozambique?

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