Science Initiative Group (SIG)

Over the past year, the Science Initiative Group has continued to support capacity building in science research and education in Africa through RISE, the Regional Initiative in Science and Education. Funded by Carnegie Corporation of New York, RISE trains Ph.D.- and M.S.-level scientists and engineers in sub-Saharan Africa in university-based networks in disciplines selected in part for their relevance to Africa's development. The RISE networks are:

AMSEN: African Materials Science and Engineering Network (Botswana, Kenya, Namibia, Nigeria, South Africa)

RISE-AFNNET: African Natural Products Network (Kenya, Tanzania, Uganda)

SABINA: Southern African Biochemistry and Informatics for Natural Products Network (Malawi, Namibia, South Africa, Tanzania)

SSAWRN: Sub-Saharan Africa Water Resources Network (Botswana, Mozambique, South Africa, Uganda)

WIO-RISE: Western Indian Ocean Regional Initiative (Mozambique, South Africa, Tanzania)

By the end of June 2010, sixty-eight students were enrolled in degree programs through RISE, about two-thirds of them working toward doctorates and the others earning masters degrees. After completing their studies under the supervision of teams of advisers from universities in their networks, most RISE graduates will commence or resume research and teaching appointments at universities in their home countries. Others will divide their time between academia and industry.

ALAN ANDERSON

Joseph Erume (right) makes his way to a community spring in a Ugandan village, accompanied by the community "chairman" (second from left) and fellow RISE researchers Justin Ekou and Irene Naigaga. Erume is studying the water quality of the spring, a source of waterborne diseases; Ekou studies the molecular biology of amoebic parasites; and Naigaga's research focuses on water quality in Lake Victoria.

While the impact of RISE is expected to grow as African universities build stronger links with one another and develop a better qualified professoriate, individual triumphs have already begun to emerge, as the following vignettes illustrate.

Sugar cane ash, a waste product of processing sugar cane, has found its way into the Ph.D. research of John Mwero, an AMSEN student from Kenya. He is seeking ways to reduce the cost of concrete, the standard building material in Nairobi, by adding agricultural waste to it. His early results showed that while large amounts of ash weaken the concrete, small amounts—about 6 to 8 percent—actually bring a slight improvement in strength.

In discussing what inspired him to study natural products chemistry, John Odda, a Ugandan researcher earning his Ph.D. through AFNNET, recalled, "Sometimes I would get sick with malaria. My

dad would walk over to some bush and come back with roots and leaves and cook them all up. He would give me something to drink and I would get well. I remember thinking, 'What magic is that?' I wanted to know what was in those plants, and I still want to know." Through RISE, Odda is researching the pharmacology of plants used in traditional medicine.

Nicholas Mphangwe, a RISE-supported Ph.D. candidate based at the Tea Research Foundation of Central Africa in Malawi, is learning how to identify genetic markers that will allow for more accurate and rapid selection of desirable tea strains. The scientists at the foundation have been raising and studying some three hundred tea cultivars, seeking to improve quality by traditional methods of hand selection. Using equipment and techniques available at the University of Pretoria, part of the SABINA network, Mphangwe will help refine this process through the use of genetic markers for qualities such as flavor, resistance to insects and diseases, and tolerance of low temperature and drought.

Irene Naigaga brought her background in veterinary medicine to her Ph.D. research project in the SSAWRN network, where she is developing an inexpensive but accurate technique to monitor water quality in Lake Victoria. She found that she can assess water quality by studying lesions in the tissue of Nile perch (tilapia), a fish that accumulates pollutants from the lake over its lifespan.

WIO-RISE Ph.D. student Grace Mutia discovered that fishermen in Zanzibar, where her research is based, crush certain seaweeds and place them in hand-woven traps as bait for parrotfish, a common local food. She believes that if she can isolate and produce the fish-attracting chemical, she can improve the lot of the fishermen and reduce the heavy demand on seaweed.

Details and other student stories can be found at www.ias.edu/rise.

ALAN ANDERSON

Grace Mutia (left), a WIO-RISE Ph.D. student, believes that she can improve the lot of fishermen in Zanzibar by isolating and producing the chemical in seaweed that attracts parrotfish, a common local food.