



RUMINATIONS

NEWSLETTER OF THE GLOBAL LIVESTOCK COLLABORATIVE RESEARCH SUPPORT PROGRAM

Tracking Disease

Conservation in the Ruaha Ecosystem with HALI

By David Wolking, International Agricultural Development Graduate Student, University of California, Davis

Meet Shukuru. He is in his mid 30s, baby-faced with soft dark eyes and a warm bright smile. His handshake is firm and welcoming, his shirt is tucked-in, and his shoes are always polished, despite the dusty roads and sandy soils around Chogela Camp. Shukuru lives in Mapogoro village, near the Pawaga-Idodi Wildlife Management Area (PIWMA) bordering Ruaha National Park (RNP). Shukuru grows crops, mainly maize, but he doesn't grow enough to feed his family. So in addition, Shukuru tracks animals. He tracks them through a complex web of social networking and word-of-mouth. He tracks them from an office where he also charges cell phones from a small solar panel for
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Fresh carcasses are invaluable to the HALI project's wildlife disease surveillance operations. The fresher the kill, the more likely they will get a viable sample. Photo by Susan Johnson.

Out of Africa

GL-CRSP and Livestock Development in Afghanistan

By Franklin Holley, MSc International Agricultural Development, University of California, Davis



Photo courtesy of the Afghan PEACE project.

The World Bank reported that in 2003 agriculture made up 36% of Afghanistan's gross domestic product (GDP). Livestock, including goats, sheep, cattle, oxen, and poultry, make up a significant part of Afghan agriculture, characterized by both sedentary (village) and nomadic smallholders. It is the latter, the Kuchi people in Afghanistan, who earn the bulk of their income from the sale of their animals. In contrast, sedentary farmers use their livestock to supplement household income and diet. Livestock is the main source of household income in rural areas

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PARIMA's Globalization Course Takes US Students to Ethiopia

This was an exciting and enlightening summer for Utah State University students Kelly Sivy, Annie Wilson, Ashley Champlin, and Leah Hazlett. The four undergraduates from the university's College of Natural Resources participated in a summer abroad course entitled "Globalization: Human and Environmental Linkages in Ethiopia" sponsored in-part by the GL-CRSP Pastoral Risk Management (PARIMA) project. The course was coordinated by faculty members Layne Coppock, also PARIMA's Principal Investigator, and Claudia Radel, project team member.

The course was developed by PARIMA team members in order to expose U.S. university students to issues pertaining to agriculture, poverty, and natural resource management in the developing world. Globalization is a central theme uniting the course topics. Accompanied by relevant readings and Egerton faculty affiliated with the PARIMA project, the students evaluated the effects of globalization on Ethiopia's economy in the sectors of livestock production, wildlife management, cut-flower production, and coffee production. They were also able to visit some of the women's collective action groups initiated by PARIMA and meet with the group leaders to learn more

about their successful micro-enterprises.

In just under a month in country, the students confronted many of the challenges that so often face developing countries like Ethiopia today, including: the choice of feeding your family versus sustainability, cash crops versus food crops, and the struggle to make a living and promote wildlife conservation simultaneously.

The course was a successful activity in that it encouraged the students to rethink their assumptions and opinions

about development and developing countries. Kelly Sivy commented to Utah State University's newspaper, Utah State Today, that "The experience opened my eyes to how different cultures have different values depending on their immediate needs. I realized that when I approach global issues, I need to consider varied perspectives." 🍷

To hear more from this year's participants in PARIMA's study abroad program in Ethiopia, you can read "Land of Lucy: Aggies Explore Impact of Globalization on Ethiopia" at the following web address: <http://www.usu.edu/ust/index.cfm?article=30867>.

LEAP Fellows Produce New Research Briefs

A new set of research briefs written by Borlaug LEAP Fellows have been published. They are available for download at the Borlaug LEAP website: <http://leap.ucdavis.edu> or by request at BorlaugLEAP@ucdavis.edu. Titles available are:

- Research Brief S07-08-05-LEAP: Up in Smoke: Biomass Burning, Land Cover Change, and Atmospheric Emissions in the Sudanian Savannas of Cote d'Ivoire*
- Research Brief Su06-08-06-LEAP: Genetic Diversity of Cacao Collections in Nigeria*
- Research Brief W06-08-07-LEAP: Combined Organic Mineral Nutrient Sources Regulate Nutrient Cycling*
- Research Brief W06-08-08-LEAP: Exploring the Role of the School-Community Relationship as an Enabling Factor in Environmental Learning*
- Research Brief F06-08-09-LEAP: Transfer of Governance and Partnership Skills Among Producer Marketing Organizations in Uganda*
- Research Brief S06-08-10-LEAP: Promoting Participation of Agricultural Households in the Milk Market: Evidence from Northern Cote d'Ivoire*
- Research Brief Su06-08-11-LEAP: Evaluation of a Potential Vaccine for East Coast Fever in African Cattle*
- Research Brief Su06-08-12-LEAP: Roundworms Useful as Biological Control Agents in the Central Rift Valley, Kenya*

HALI Project Envirovet Institute 2008 a Success!

By Dr. Liz Van Wormer, UC Davis Wildlife Health Center and Dr. Deana Clifford, HALI Project Coordinator, UC Davis

The morning air is warm in Mikumi National Park, Tanzania as wildlife veterinarians and twenty-three Envirovet Summer Institute participants monitor an immobilized female giraffe. One student leans over confidently, stethoscope in hand, to measure the heart rate while others collect diverse samples for a research project studying an emerging giraffe ear disease. Only a week later, the group is testing domestic zebu cattle for tuberculosis (TB) in a Maasai livestock boma. The students stay alert for signs of TB, (which can be transmitted to other animals and humans) in wildlife as they survey buffalo populations in Ruaha National Park a few days later. The participants then investigate the role of wildlife conflict and the use of irrigation on nearby farms before transitioning to effects of seaweed farming on local livelihoods and the marine environment in Zanzibar.

The common theme uniting these diverse activities is health, and the Envirovet Summer Institute is devoted to training veterinarians, veterinary students and wildlife researchers in the techniques, challenges and applications of ecosystem health. This broad topic brings together wildlife, domestic animal, human and environmental health, attracting enthusiastic participants from around the world. Students spend four weeks training in the United

States emphasizing ecosystem health in the developed world before focusing on issues and skills for developing nations. 2008 marks the first year of the course in Tanzania, a country whose rich wildlife resources and dedication to conservation provide a diverse living laboratory for studying health in terrestrial and marine systems. In settings ranging from rural farms to veterinary investigation centers to large protected areas, the Envirovet students build the unique knowledge, skills and connections to serve as stewards, researchers and advocates of ecosystem health in their future careers.

This year's Envirovet Developing Country Session in Tanzania was hosted by the GL-CRSP Health for Animals and Livelihood Improvement (HALI) project, with assistance from project partners including: Sokoine University of Agriculture, University of California at Davis, Tanzania National Parks, Wildlife Conservation Society Ruaha Landscape Program, and the Institute for Marine Studies in Zanzibar. Participants hailed from Canada, Mexico, Nigeria, Sri Lanka, India, Tanzania, Uganda and the United States. Assistance from GL-CRSP enabled five talented African young professionals to attend this course.

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The 2009 Envirovet Summer Institute has been scheduled for 16 June - 10 August 2009. The first session will take place in Florida and Georgia, the second session will again be in Tanzania. 🐾

For more information on the Envirovet Summer Institute, please visit the website at: <http://vetmed.illinois.edu/envirovet/index.html>

World Food Prize Symposium Inspires Borlaug LEAP Fellows

On October 15th, five Fellows from the USAID funded Norman E. Borlaug Leadership Enhancement in Agriculture Fellowship Program (LEAP) traveled to Des Moines, Iowa to participate in the World Food Prize Symposium (WFP), an annual event honoring outstanding individuals making vital contributions to improving the quality, quantity, or availability of food throughout the world.

LEAP Fellows attending the WFP were: Mamadou Chetima, Pauline Nhamo, John Recha, Lenis Saweda Liverpool, and Idris Amusan. In Des Moines, the Fellows met Dr. Norman Borlaug and a host of leading scientists, officials, and leaders from over 60 countries. The WFP provided an ideal networking environment for the Fellows, and inspired them to, according to Fellow John Recha, “achieve leadership within [their] fields to help alleviate hunger and poverty.”

The WFP was created in 1986 due to the influence of Dr. Norman E.



Borlaug LEAP Fellows with Dr. Norman E. Borlaug (seated). Standing from left to right, Pauline Nhamo, Lenis Liverpool, Mamadou Chetima, John Recha and Idris Amusan.

Borlaug, winner of the Nobel Peace Prize in 1970. Organized by the WFP Foundation, the events in Des Moines are intended not only to reward contributions to global agriculture, but also to promote health, enhanced nutrition, and safety both at home and abroad through the annual Norman E. Borlaug International Symposium or “Borlaug Dialogue.” The Borlaug Dialogue brings together international experts in food policy and nutrition to discuss current issues and themes affecting the global food supply. This year’s theme, “Confronting

Crisis: Agriculture and Global Development, the next 50 years,” provided a forum to discuss the state of the current world food crisis and the future of development over the next fifty years.

This year’s World Food Prize recognized the McGovern-Dole international school feeding program. The program, led by former US Senators George McGovern and Robert Dole, has provided meals to feed more than 22 million children in 41 countries. 🌍🍴



Borlaug LEAP Fellows joined USDA Borlaug short-term program participants on a study tour of Iowa agriculture including this tour of the Chichaqua Greenbelt Westlands prairie restoration project.

[The World Food Prize Symposium] will have a positively indelible impact in the way I view global food security. It was inspiring and memorable meeting the legendary plant breeder, Dr. Norman Borlaug... the Iowa field trips reinforced my strong support and advocacy for greater investments in rural infrastructural development and economies by governments in developing nations, as a requisite for promoting sustainable agriculture and sustainable economic development. ...The World Food Prize is truly a world-class event.

–Idris Amusan, Nigeria, Purdue University/IITA, Borlaug LEAP Fellow, Spring 2008



Borlaug LEAP Fellows Idris Amusan and Lenis Liverpool with Judy Wakhungu (center), Executive Director of the African Center for Technology Studies.

The most important aspect of the symposium was networking. I had a lifetime opportunity of meeting people I never imagined [including] World Food Prize laureates, eminent agriculturalists, faculty and researcher fellows, dignitaries from government and non-governmental organizations, African diplomats, USDA staff, and Dr. Borlaug himself. I made a total of 115 new contacts, and was thrilled when many of these leaders requested my resume and wanted to network with me too for a better future.

–John Recha, Kenya, Cornell University/ICRAF, Borlaug LEAP Fellow, Spring 2008



Hon. George McGovern (left) with Borlaug LEAP Fellow, Mamadou Chetima (right). Former US Senators McGovern and Robert Dole received the 2008 World Food Prize for their continued leadership in encouraging a global commitment to school feeding and enhanced school attendance and nutrition for millions of the world's poorest children.

The Borlaug Dialogue brought minds from different spheres, and ... we were reminded of the long road ahead for economic development in developing countries, particularly Sub-Saharan Africa, and the critical role that agriculture can and must play.... to see all of the different ways the work of Norman Borlaug has affected humanity, to see the collaborations and interactions that his work and life have fostered (including LEAP!), I am impressed and challenged. He is truly a man of vision, hardworking and determined, extremely wise and cognizant of the fact that while alone, one can make a difference, with others, one can truly change the world!

– Lenis Saweda Onipede Liverpool, Sierra Leon, University of Illinois-Champaign Urbana/IFPRI Borlaug LEAP Fellow, Spring 2006



Borlaug LEAP Fellow Idris Amusan discusses the Lugar-Casey bill with Jay Branegan, Senate Foreign Relations Committee staff.

What struck me most was the realization that there are many people out there who are putting efforts to fight world hunger, especially in Africa.... This was especially important for me now, as I am finishing up my studies. I now have ideas on what areas I would like to research, to help fight world hunger.

–Pauline Nhamo, Zimbabwe University of California, Davis/TSBF-CIAT, Borlaug LEAP Fellow, Winter 2006



Borlaug LEAP Fellows, from left to right, John Recha, Lenis Liverpool, Idris Amusan, Pauline Nhamo and Mamadou Chetima at the World Food Prize Ceremony.

The Borlaug LEAP provides supplemental funding for the thesis research of graduate students from developing countries who show strong promise as leaders in the field of agriculture and related disciplines. Since 2006, the Borlaug LEAP has awarded over \$760,000 to 41 students from 20 countries, with 44% of these awards going to female students. The LEAP program partners students with mentors from US universities and the CGIAR centers to provide both an enriching academic and professional support network. Borlaug LEAP is administered by the Management Entity at the University of California, Davis.

For more information on the World Food Prize and Norman E. Borlaug International Symposium, please visit their homepage at: www.worldfoodprize.org. For more information on the Borlaug Leadership Enhancement in Agriculture Fellowship Program (LEAP), including the Fellows' experience at the World Food Prize events, please visit: <http://leap.ucdavis.edu>.

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Out of Africa: GLCRSP & Livestock Development in Afghanistan

with 82% of all Afghan families owning livestock. Drought, ongoing civil conflict and land disputes, however, are threatening the viability of the Afghan livestock sector. The ability of public institutions to enrich capacity among Afghan livestock holders and develop the livestock sector is also limited by several factors including deficiencies in disease surveillance and control, vaccine regulation and quality assurance, laboratory facilities, and staff salaries.

In response, the GL-CRSP has formed partnerships to improve the situation of Afghan livestock holders via research, market access, and policy recommendations regarding the development and sustainability of the Afghan livestock sector. Facilitating those partnerships is the Afghan PEACE (Pastoral Engagement, Adaptation, and Capacity Enhancement) project. Afghan PEACE was initiated in 2006 in response to a request by the Afghanistan government to address issues negatively affecting livestock production within the country.

By providing more timely information on emerging forage conditions and market prices and by increasing the number of cash generating livestock enterprises for pastoralists, the project aims to reduce the social and economic risks associated

with livestock production. Afghan PEACE utilizes the GL-CRSP Livestock Early Warning System (LEWS) and the Livestock Information Network and Knowledge System (LINKS) to provide herders with improved and current information regarding the nutritional content of grazing lands, both present and into the near future. The PEACE project also facilitates conflict resolution processes within pastoral communities across Afghanistan.

More recently, the GL-CRSP and the PEACE project have partnered with A4, the Advancing Afghan Agriculture Alliance, to sponsor a Livestock Workshop that brought together representatives from Afghan and international implementing agencies. “The workshop focused on harnessing the collective experiences of the different organizations to identify key priorities in their activities, explore possibilities for program collaboration, and to develop strategies for raising livestock awareness at the producer, ministerial, and donor levels” (GL-CRSP Livestock Workshop Report). Over 50

representatives from Afghan and U.S. universities, small and large national and international non-governmental organizations, private consultants, and governmental bodies including USDA and USAID convened in Kabul for the workshop.

Presentations concerning marketing, health and capacity within the Afghan livestock sector preceded group conversations and reflection on topics including policy



Participants at the GL-CRSP Livestock Workshop in Afghanistan worked in small groups to identify constraints facing the livestock sector and to set priorities for an approach to development.

and planning, agricultural production, marketing, and human capacity. Based on these conversations, groups identified constraints facing the livestock sector and set priorities for a development approach.

Participants worked together to form an integrated approach to livestock development in

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New Podcasts at GL-CRSP Website Explore Recent Research Presented at Food Price Crisis Symposium

On October 10, 2008, The Giannini Foundation of Agricultural Economics at the University of California hosted a symposium to present the main results of recent research on the current food price crisis conducted at UC Berkeley and UC Davis. Audience members represented various disciplines, and the presentations provided non-technical summaries that facilitated the understanding of the main issues and consequences relevant to the food price crisis.

Nine podcasts from the Symposium can be found on the GL-CRSP website at: <http://glcrsp.ucdavis.edu/podcasts/>. See Volume 4, Episodes 1-9.

Episode 1. Welcome – Larry Karp (UC Berkeley)

Episode 2. Causes of the food crisis – Aaron Smith (UC Davis) and Gordon Rausser (UC Berkeley)



Episode 3. Biofuel policy and food prices – David Zilberman (UC Berkeley)

Episode 4. Speculators, storage, and food prices – Brian Wright (UC Berkeley)

Episode 5. Agricultural research & development and food prices – Julian Alston (UC Davis)

Episode 6. Identification of the vulnerable in developing countries – Alain de Janvry (UC Berkeley)

Episode 7. Measuring consumer price response in developing countries – Ethan Ligon (UC Berkeley)

Episode 8. Effects on US consumers & producers and subsidy payments – Daniel Sumner (UC Davis)

Episode 9. Panel discussion – Alex McCalla (UC Davis), Gordon Rausser (UC Berkeley), Daniel Sumner (UC Davis), and Brian Wright (UC Berkeley)

Presentations from the symposium and more in-depth results of the research projects will be available via working papers posted online at the Symposium's website: <http://are.berkeley.edu/foodcrisis/>. 🎧

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Afghanistan. The approach focuses on: 1) capacity building among livestock sector participants from the producer level to the Ministerial levels including long-term investment in higher education; 2) value chain development so that the producer-consumer link is strengthened, value is added to the final good and constraints are minimized; and 3) creating an enabling policy environment whereby decisions are informed and contribute to strategic planning. Furthermore, reliable information, credit, infrastructure and a consistent donor approach are key to the success of livestock development in Afghanistan.

The final day of the workshop emphasized turning priorities

into “actionable objectives.” Peer NGOs, government representatives, and donors were identified as the mechanisms that would enable actions after the close of the workshop. For example, increased communication and collaboration among NGOs working in livestock development could include actions such as collaborating on lamb fattening trials, inviting agriculture students from local universities to work as interns in livestock projects, and creating a livestock-devoted website where news, updates, and information can be made available. It was also stressed that NGOs must communicate with the Ministry of Agriculture, Irrigation and Livestock (MAIL) to align their

activities and objectives in order to enhance the Afghan livestock sector together rather than competing with one another in the process. Participants also noted that long-term donor support will be crucial to implementing these actions and achieving sustainable results.

Participants agreed that the next best step is to form a leadership committee that will engage all actors in the Afghan livestock sector, including senior Ministry personnel, in a collaborative effort to put prioritized strategies into practice. 🎧

For more on the Afghan PEACE project or the Livestock Synthesis report, please visit <http://afghanpeace.org>. Or contact the GLCRSP Management Entity at glcrsp@ucdavis.edu.

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Tracking disease: Conservation in the Ruaha Ecosystem

500 TZS, roughly \$0.50 US. He tracks them in collaboration with the community wildlife management organization. But Shukuru does not track just any animals. He tracks the dead. With help from his colleague Coaster, Shukuru tracks down carcasses to investigate diseases in wildlife. He is part of the GL-CRSP Health for Animals and Livelihood Improvement (HALI) project wildlife disease surveillance team.

The wildlife disease surveillance team is comprised of two scouts with an ear to the ground for fresh kills. They get a tip, hunters have taken down an antelope, taken down a buffalo, a giraffe, and they move. Time is of the essence.

Coaster and Shukuru bicycle to the site and get to work. Each scout bike is equipped with necropsy equipment, machetes, knives, gloves, buckets, 10% buffered Formalin solution, and zip lock bags. They perform a rough field autopsy. Where are the entry and exit wounds? Are there cartridges nearby? It may seem odd to do an autopsy on a hunter-killed

carcass, but they are not just looking for the cause of death. They are also searching for life. Each of these carcasses provides the HALI team with a snapshot of disease afflicting wildlife in the Ruaha ecosystem. Each of these carcasses is an opportunity to collect data, data that the team is restricted from obtaining from live animals. It's CSI Ruaha, but without the glamour, fancy sets, and cynical dialogue, and with much better scenery.

The HALI project has been collecting disease data from carcasses in the Ruaha area since 2006. To date, the HALI project has collected 40 samples from wildlife carcasses,

largely felled by legal hunters collaborating with the HALI team, but also including poached kills and road kill. Game scouts like Coaster and Shukuru are trained by HALI in field veterinary methodology. They are surgeons of the dead animal kingdom. They swiftly cut through flesh and remove sections of the animal's internal organs. They take samples from the liver, spleen, lungs, and lymph nodes. If the animal is openly bleeding, blood samples are taken from the heart, the source. It is essential that the team arrive quickly to the scene to ensure that all samples are viable. After death, the blood begins to clot, and proteins in the blood's plasma respond through coagulation to strengthen a platelet plug, a response to reduce blood loss from damaged blood vessel tissue. During coagulation, proteins change the plasma. This change destroys the serum and therefore the viability of the sample. The serum is necessary in the diagnosis of Brucella, a major zoonotic disease of interest for HALI and RNP. Therefore time is indeed of the essence, and the scout's ability to quickly respond to information on fresh carcasses is invaluable to the project's wildlife disease surveillance operations.

The fresh samples obtained by the scouts are taken to the



*Setting up camp for game scouts Coaster and Shukuru.
Photo by David Wolking.*



Shukuru (right), HALI project Game Scout, and HALI master's student Dr. Annette Kitambi (left) engage in water sampling activities near Ruaha National Park. Photo by Woutrina Miller.

HALI bush camp for temporary storage. I visited HALI Bush Camp in August with Project Coordinator Deana Clifford of the UC Davis Wildlife Health Center. HALI bush camp is located inside Chogela Camp grounds, a relaxing backpacker getaway along the Tungamalenga River near the RNP border. At the time, the camp was a patch of scorched earth, and a team was contracted to construct a mini-camp for Coaster and Shukuru. Within a day, a thatch-roofed banda appeared, and three solar panels powering a deep box freezer and centrifuge were installed. Coaster, dressed in olive drab military fatigues, black combat boots, and bush hat, stays in a tent next to the freezer, waiting for a call, waiting for a carcass.

I spoke with Coaster over lunch at Chogela camp. He is a friendly type, big smile and rough red-shot eyes. He was employed as a game scout for the community wildlife management group prior to joining HALI, tasked with identifying poachers in the WMA

in the name of conservation. He has the air of a politician, a light humored and crafty style well suited for navigating the rough environment of wildlife enforcement. It can be a brutal world. Another community wildlife management game scout reported a poacher to local authorities last year, an apparently well-connected individual, and after refusing to back down from the charges, the scout's house was burned to the ground. This is not Mc Playland. It's a dangerous world where the adversary is armed and the activity illegal. When they work with HALI, Coaster and Shukuru enjoy a bit more freedom from their traditional enforcement and patrol duties

as community wildlife management game scouts, along with the technical training and more responsibility. They are the first responders, charged with the kill and also the killer, as they work closely with a wide variety of stakeholders, especially legal hunting companies and guides, which requires the scouts to be both technicians and diplomats.

After taking a sample from a carcass, Coaster stores them in the freezer, and then spins any blood samples in the centrifuge to obtain the serum for testing Brucella. He radios Shukuru, who then calls a HALI team member at the project's home base in Iringa. With the HALI veterinary staff (Dr. Harrison Sadiki and Howard Kombe), Coaster and Shukuru will process the tissue samples further before they are transported to the Sokoine

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Wildlife Conservation Society team member Edmund Chota holds the horns of a water buffalo carcass in Ruaha National Park. The bull was spotted by the HALI team while engaged in a veterinary field training program, and subsequently sampled for disease testing in collaboration with Ruaha National Park veterinary staff. Photo courtesy of HALI project.

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Tracking Disease: Conservation in the Ruaha Ecosystem

University of Agriculture (SUA) laboratory for analysis, eight hours drive east. There, Professor Rudovick Kazwala, along with HALI support, has equipped a laboratory for the testing and analysis of tuberculosis (TB), Brucella, and other zoonotic diseases. The lab is spartan, with concrete walls, a bench, some chairs, a single PC computer, a few sinks, and a roughshod bookcase full of chemicals; but still contains the needed biosafety hood, incubator and other specialized equipment needed to work with an infectious agent like TB. At first glance, the lab appears hardly more equipped than a Detroit public school chemistry classroom. But in Tanzania, this is cutting edge, and Kazwala is a far cry from a Detroit public school teacher.

Understanding disease is the primary objective of the HALI project. The hidden objective, the unspoken passion for team researchers, for field staff, and for Shukuru, is conservation. In Kruger National Park in South Africa, bovine tuberculosis (BTB) was identified in buffalo. It soon spread to carnivores, and lions began to test sero-positive. The bacteria jumped species. This is zoonosis. In Ruaha, buffalo commonly graze and share water holes not only with

other wildlife and carnivores, but also with domestic livestock; and in Ruaha, livestock are a culture and a way of life. Pastoralists from the Maasai, Barabaig, and Sukuma tribes



Coaster, HALI Game Scout, standing with tusks from a poached elephant near Ruaha National Park. Photo by Deana Clifford.

graze animals in and around WMAs. They live off of maize, milk, meat, and blood. The milk is often unpasteurized, and blood is consumed fresh. Around the WMA, pastoralists share water sources with their animals. If the water is treated, it is boiled. Often, it is not.

The proximity and potential for contact between wildlife, livestock, and pastoralists provides a deadly canvas for an outbreak of zoonotic diseases, threatening both livelihoods and conservation. In 2005, this canvas caught the attention of researchers from the UC Davis Wildlife Health Center and University of Vermont's Rubenstein School for Natural Resources and the Environment. It also caught the attention of Dr. Pete Coppolillo, Director of the Wildlife Conservation Society's Ruaha Landscape Program. Pete and Dr. Jonna Mazet, HALI's principal investigator, met by chance at a wildlife and conservation conference in South Africa and a few months later, the HALI Project was born.

Developing in coordination with the Wildlife Conservation Society's "One Health" paradigm, in which human health and animal health are perceived as intimately connected, the Health for Animals and Livelihood Improvement (HALI) project was established to assess the effects of zoonotic disease and water management on animal health, biodiversity, and livelihoods in the Ruaha ecosystem, Tanzania. Utilizing an integrated approach, based on interrelated pathogen and

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Stakeholders Participate in ENAM Dissemination Meeting

By Grace S. Marquis, ENAM Lead Principal Investigator, McGill University/Iowa State University; and Kimberly Harding, Graduate Student, McGill University

Throughout the five years of development and implementation of the ENAM project, there has been a strong commitment to involve key stakeholders from government, non-government organizations (NGO), private sector, and communities. Initial project activities included a stakeholders' workshop in 2003 to identify the barriers to the incorporation of animal source foods in children's diets and to develop a problem model that would guide an intervention to improve child nutrition. Different stakeholders have played key roles throughout the four years of the project, participating in training, designing curricula, and data analysis of project outcomes. A dissemination meeting for stakeholders was held in Accra, Ghana with the following objectives:

- present project results for all partners to discuss and provide confirmation of their interpretation,
- give voice to community participants and rural bank staff so that their experience could be understood by other partners,
- launch nutrition and entrepreneurial education materials that were developed for rural communities
- advocate for the promotion of young child nutrition among health and non-health government ministries, and
- plan activities related to scaling up and sustainability of project activities.

Over 80 stakeholders, representing the multiple sectors of society attended, including: research and higher education, governmental ministries, international bilateral assistance agencies, and international and national non-governmental organizations attended the workshop. The attendees included experts in nutrition, dietetics, food science, agriculture, agricultural extension, animal science, animal research, economics,



The ENAM Caregiver Credit and Savings Associations were formed based on solidarity groups that appraised and guaranteed individual loans. After four years of loan disbursement / savings / education cycles, the ENAM groups have had an impressive 100% repayment rate. Photo by Susan Johnson.

consumer sciences and nursing, coming from diverse regions of Ghana and North America.

The workshop provided a forum by which all components of the ENAM project could be showcased and the primary project results could be presented and discussed among all stakeholders. Key study findings included:

- Four loan disbursement / savings / education cycles were completed among 549 women with 100% repayment. Perceptions of improved business earnings was higher among the intervention as compared to the control caregivers.
- Households were less likely to be food insecure after intervention. Generally there were significant differences in indicators of child nutritional status over the course of the study. As compared to children from control households, children of participants grew better.
- Child health and nutrition knowledge score at the end of the project was significantly higher for participant than control caregivers. After the implementation of the project, participant caregivers fed their children more frequently and more diverse ASF than control caregivers.

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Participants included representatives of the University of Ghana, Noguchi Memorial Institute of Medical Research, Iowa State University, Columbia University, McGill University, University of California-Davis (GLCRSP Management Entity) and USAID. The Ghanaian government was represented by staff from the Ministry of Food and Agriculture, Ghana Health Service, Ministry of Women and Children's Affairs and Rural Health Training School (Kintampo). NGOs were represented through staff from Heifer-Ghana, Plan-Ghana, World Vision, Catholic Relief Services, Lighthouse Chapel International, Freedom from Hunger, Rural Women's Association, Christian Rural Aid Network, and Abrono Organic Farming Project. Officers from Fiagya, Akyempim and Naara Rural Banks as well as community participants from ENAM Credit and Savings Associations (CSA) also attended. Photo by Susan Johnson.

- The intervention was associated with higher protein, calcium and zinc intakes in the intervention compared to the control group. In addition, the intervention group had higher proportion consuming at least once in a week meat, organ meat, shell fish, poultry, egg, and milk.

Case studies provided insight into caregivers' perceptions of successful and less successful participation in project interventions and participants' real life experiences with respect to the projects' impact on their businesses, children, and food habits. Twelve 'successful' and six 'less successful' ENAM participants were purposefully selected. Success was tied to having a supportive family, previous business experience, business commitment and vision, higher loan amount and being healthy. Strategies that were enabling for women included:

1. Choosing a business based on previous experience
2. Expand and diversify the business
3. Anticipate the ups and downs of the market
4. Invest in one business to finance another

The second day of presentations was focused on the role of our partners to move to a sustainable intervention. The project's collaboration

with Freedom from Hunger (FFH) - Ghana's "Credit with Education" program has allowed for the building of local institutional capacity to implement health, nutrition and business education with micro-credit. The ENAM project and FFH-Ghana partnered with three rural banks to implement the program in the project communities. The initial assessment has revealed a great potential for profitable microfinance for these banks. There is a high concentration of people, income generating activities are varied, and they are all located in or near big markets and commercial centers. The program benefits both the bank and the clients.

ENAM's work with peer educators was presented as another mechanism for sustainable educational activities. The project is developing curricula for peer educators to provide nutrition education and entrepreneurial education to community caregivers. Manuals and flipcharts utilize educational tools developed by ENAM staff. One of the highlights of the workshop was a panel discussion with women from the Credit and Savings Associations. One CSA representative from each of the six ENAM intervention communities participated in the panel. The women had the opportunity to share with the other stakeholders their involvement with the

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ENAM project and how it has affected their lives.

The final activity at the workshop was to address the question “How could the approach be extended to a wider number of people?” Participants reiterated the need for short courses for community-based staff and suggested that rural banks incorporate the educational model in their credit services. A final important outcome of the workshop was the identification of a national-level committee to guide the project to the next phase – scaled up and sustainable. 🤝

For more information on the ENAM project, please contact Dr. Grace Marquis at grace.marquis@mcgill.ca.



ENAM project researchers have developed nutrition education flip charts that use pictures to illustrate the lesson. Peer educators have been trained in each of the intervention communities.

A participatory approach was used to identify income generation activities (IGA). Financial and training support packages were developed for each IGA.



Photos by Susan Johnson

Below, ENAM student Samuel Oluka (left) and Dr. Anna Larrey.



Photo to left: Josephine Martei, Freedom from Hunger-Ghana (center) with Fiagya Rural Bank officials, Kwame Adu-gyamfi, Credit Officer (right) and Akwasi Owusu-Sekyere General Manager (left).

Photo to right: Alice Dawson, Women in Agricultural Development, MOFA with Dr. Ben Ahunu, University of Ghana (right).



Above, ENAM student Lynda Hagan discusses her research with a workshop participant during the poster session.



Small group discussion focused on mechanisms for sustainability and dissemination of results.

2009 GL-CRSP Jim Ellis Mentorship Awards Announced

Four graduate students from three different universities have been selected as recipients of the 2009 Global Livestock CRSP Jim Ellis Mentorship Award. The grants provide thesis support to outstanding graduate students affiliated with GL-CRSP projects. We are pleased to announce the following recipients:

Voké Kakpovbia, from McGill University, is conducting field research in collaboration with the ENAM project in Ghana. Her project is



Voké Kakpovbia

entitled, *“Feeding Style and Dietary Intake in Ghanaian Children Two to Five Years of Age.”* This project is thus intended to determine if feeding style is related to dietary intake in two to five-year old Ghanaian children in the Techiman and Navrongo districts of Ghana. The conclusions will contribute to a growing body of literature about parental feeding styles and their role in the nutrient intake of young children.

Jacob Msuya, from the Development Studies Institute in Morogoro, Tanzania, is conducting field research with the AFS project in Tanzania. His project is entitled, *“Assessment of the Socio-economic Impact on Village Chickens Vaccinated*



Jacob Msuya

against Newcastle Disease in a Rural Community in Mvomero District, Morogoro, Tanzania.” The study will assess the socio-economic impact of Newcastle Disease vaccinated chickens in the households and rural communities in relation to their productivity, contribution to household

income, social relationships within and among households before and after vaccination, and people’s perceptions of the project and related sustainable development initiatives.



Gibonce Andrew Kayuni

Gibonce Andrew Kayuni, from the Development Studies Institute in Morogoro, Tanzania is conducting field research with the AFS project. His thesis is entitled, *“Socio-economic Impact Assessment of the Newcastle Disease and Avian Influenza Project in Selected Villages in Ufukoni*

Ward, Mtwara, Tanzania.” The purpose of this project is to assess the impact that the Newcastle Disease and Avian Flu Control Project has had on village households with respect to income from chicken production, household food security, consumption of eggs and chicken among village children and women, the empowerment of village women, and community support of the project.

Patrick Kojo Ahiabor, from the University of Ghana, is conducting field research in collaboration with the AFS project. His project is entitled, *“Enhancing Production of Local Chickens through Newcastle Disease the I2 Vaccine in the Techiman District of Ghana.”* This project will evaluate the efficacy of the NDI2 vaccine in local chickens and measure the vaccine’s impact on poultry production. The study will assess the ability of the NDI2 vaccine to spread bird to bird, which can improve vaccine coverage when some birds are missed in vaccination efforts. The transmission rate will be used to establish the number of birds that must be vaccinated to achieve herd immunity.



Patrick Kojo Ahiabor

USAID Mission Highlights GL-CRSP Mali Livestock and Pastoralist Initiative

The Summer 2008 issue of *Ruminations* introduced the new Mali Livestock and Pastoralist Initiative (MLPI), a GL-CRSP project formed to take successful technologies and tools developed and implemented in East Africa and transfer them to Mali with an emphasis on the northern regions of the country. MLPI will utilize LINKS (Livestock Information Network and Knowledge System) technologies and PARIMA

(Pastoral Risk Management) tools to establish a livestock market information system and build capacity for improving marketing options and livestock fattening in the region.

Very soon after the GL-CRSP announced MLPI, the Bamako USAID Mission featured an article authored by project Principal Investigator Jay Angerer entitled “USAID

Supports Livestock and Pastoralism in Mali Through an Innovative Effort” in the June-August issue of *BAM!*, the Mission’s newsletter. In addition to highlighting the project activities, Angerer described a visit to the Niamana market outside of Bamako. At the market, team members met with the BENKADY cooperative to discuss ways in which they could collaborate in order to facilitate the sale of livestock. Photographs of livestock were taken at the market to later be used in training producers and market monitors on animal characteristics and conditions (including breed, sex, age and grade) that maximize the selling price.

Much of this information has been used to inform the initial version of the livestock market information software deployed in Mali in July. Market information will eventually be available to livestock producers by cell phone via SMS (short message service received in text message format) to not only provide informed and improved marketing, but work toward livelihood improvement and economic development at a national level. 📱📶

You can find the electronic version of the Summer 2008 editions of *BAM!* at: http://glcrsp.ucdavis.edu/news/media/BAM_June_August%202008.pdf.

For more information on MLPI, please contact Jay Angerer, jangerer@cnrit.tamu.edu or John McPeak, jomcpeak@maxwell.syr.edu.

Research Briefs Available

The following research briefs have recently been published by the GL-CRSP. Copies are available for download at the GL-CRSP website: <http://glcrsp.ucdavis.edu/publications> or can be requested by writing the Management Entity at glcrsp@ucdavis.edu.

HIV Nutrition Project

Research Brief 08-01-HNP: Introduction to the HIV Nutrition Project (HNP): Increasing Animal Source Foods (ASF) in Diets of HIV-infected Kenyan Women and Their Children

Research Brief 08-02-HNP: HIV Infection and Nutrition Status: The Importance of Food in Disease Management

Research Brief 08-03-HNP: The Academic Model Providing Access to Healthcare (AMPATH) in Kenya

Health for Animals and Livelihood Improvement

Research Brief 08-01-HALI: Evaluating and Managing Zoonotic Disease Risk in Rural Tanzania

Research Brief 08-02-HALI: The Unintended Consequences of Development Assistance: The Case of the Usanga in Tanzania

Research Brief 08-03-HALI: Innovative Approaches to Evaluate Household Health and Livelihoods in Pastoral and Agropastoral Communities

Avian Flu School

Research Brief 08-01-AFS: The Avian Flu School’s “Train the Trainer” Courses: An Overview and Assessment

Research Brief 08-02-AFS: An Overview of the Newcastle Disease Avian Influenza Control Research Project

For a complete list of Research Briefs available, please visit the GL-CRSP website at <http://glcrsp.ucdavis.edu>.

(continued from page 10)

Tracking disease: Conservation in the Ruaha Ecosystem

disease sampling activities in water, livestock, and wildlife, the HALI project is investigating the disease burden of the Ruaha ecosystem in order to develop a surveillance system for the prevention and control of zoonotic diseases. Wildlife play a critical role in the understanding of zoonotic diseases and their spread in Ruaha, as they represent an often understood and unknown reservoir for infectious disease. However, due to the difficulties in obtaining regulatory approval for the collection of samples from live animals, the HALI team looked to bush meat, building partnerships with the hunting community, in order to

gain access to wildlife carcasses for sampling.

Though at times overlooked or ignored, bush meat is a rich source of microbes and pathogenic organisms, and both game and road kill support the microbe trade between wildlife and humans. Bush meat provide a dangerous vector for disease transmission as the carcass becomes a potential exposure pathway for a variety of zoonotic diseases, like Ebola in Gabon for example, where an outbreak was traced to the slaughtering of chimpanzee carcasses.¹ To help prevent the spread of zoonoses around Ruaha, the HALI project launched a zoonotic disease education campaign, distributing brochures to professional hunters in the area about BTB in wildlife, along with simple ways to protect hunting staff from becoming infected. While moderately successful, cooperation with hunters and hunting operations in Ruaha continues to be a challenge for the HALI team, as wildlife researchers are often perceived as wildlife advocates and therefore anti-hunting, a perception with damaging impacts on communication and relationship building between HALI researchers and the hunting community.

So when the HALI scouts do communicate with hunters and hear about a carcass, they make

tracks. The fresher the kill, the more likely they'll get a viable sample, and improve disease monitoring and surveillance. With a positive identification at SUA, they can inform policy makers and the community on disease emergence and potential epidemics. They can track the disease, and in turn help communities to prevent it. They can monitor disease, helping RNP to prepare for and prevent epidemics in wildlife, and protecting those who interact in near proximity with it, the hunters and pastoralists. In essence, HALI's wildlife disease surveillance work is designed not only to promote the conservation agenda and lucrative wildlife tourism industry through enhanced wildlife health, but also the broader context of livestock and community health. 🐾

For more on the Health for Animals and Livelihood Improvement (HALI) project, please visit the GL-CRSP homepage at <http://glcrsp.ucdavis.edu>, or the new HALI Pproject blog at <http://haliproject.wordpress.com>.

David Wolking, Jim Ellis Awardee, is a graduate student in International Agriculture Development at UC Davis. He worked in collaboration with the HALI Project in the fall of 2008 as part of his master's thesis. He can be reached by email: djwolving@ucdavis.edu.

Endnote

1. Wildlife Conservation Society. 2005. "Study Links Ebola Outbreaks To Animal Carcasses." *ScienceDaily*, February 21, 2005. [Accessed November 12, 2008: <http://www.sciencedaily.com/releases/2005/02/050218155913.htm>.

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