

THE IMPROVEMENT OF FOOD SUPPLY IN KENYA, AFRICA:
A PERSONAL PERSPECTIVE
by Amanda James

The World Food Prize Organization sponsors an annual symposium for the study of food scarcity. High School students from across Iowa research the issues of world hunger and come to Des Moines to present their papers before some of the World Food Prize laureates and other recognized experts in this field who critique their presentations. The 1997 institute focused on food scarcity in Sub-Saharan Africa. Subsequently, student participants were invited for the first time to apply for a summer internship to gain "hands on" experience in the struggle against hunger. As a result, I was given the opportunity to work under the direction of Dr. Hans R. Herren, a 1995 World Food Prize Laureate, at the International Center of Insect Physiology and Ecology (ICIPE) in Nairobi, Kenya, which is located on the East coast of Africa.

The World Food Prize was established in 1986 to honor those who have made a significant and measurable contribution to improving the world's food supply. The founder was Dr. Norman E. Borlaug, who was the winner of the 1970 Nobel Peace Prize for his work in world agriculture. He envisioned the Food Prize as a means of creating role models who would inspire others to take on the challenge of conquering world scarcity. Dr. Borlaug's goal has now been taken one step further: Youth involvement through the study of food scarcity. The summer internship allows interested students to tackle the problems of food security as they work along side World Food Prize laureates and other authorities on food production and world hunger.

The research and study in preparing my paper regarding food scarcity of Sub-Saharan Africa and the thought provoking discussions at the 1997 Symposium of World Food Prize laureates stimulated my interest to become a part of the solution to Africa's hunger problems. Thus, the invitation to work as an intern with Dr. Herren allowed me to move from the sidelines to the playing field in the fight against food scarcity.

Dr. Herren is a Swiss born entomologist, who is widely acclaimed for his leadership role at the International Institute of

Tropical Agriculture. He pioneered the development and implementation of a biological control project for the cassava mealybug, which nearly destroyed the entire African cassava crop.

By introducing an insect that was a natural predator of the mealybug, the production of the cassava crop was stabilized. This technique was a monumental achievement because the cassava crop forms a basic food staple for two hundred million Africans and serves as a reserve for the poor against famine. Dr. Herren's success in using biological control of the cassava mealybug soon became the model for others to follow, which has proven both ecologically and economically sound.

Currently, Dr. Herren is Director General of the International Center of Insect Physiology and Ecology (ICIPE) in Nairobi, Kenya, which is a leading proponent for the development of biological controls and other ecologically sound pest and vector management methods throughout Africa and the tropics. The Center was established in 1970 as an advanced research institute which strives to provide alternatives for mis-use and over-use of synthetic pesticides. In 1986, ICIPE was registered as an intergovernmental organization. It is funded through a sponsoring group of 16 countries and has a 360 member staff representing 19 different countries, located primarily in the third world.

ICIPE has adopted a mission of developing technologies to reduce poverty and to increase food security through management and knowledge of both harmful and useful orthopods. Teams of scientists working in ecosystems study behavioral biology, chemical ecology, molecular biology, and bio-technology. They are especially cognizant of the social, economic, and political factors that impact the success or their work. Thus, the Center has developed educational and training facilities which benefit everyone from post doctoral scientists to the uneducated farmers of the region.

In the past two decades, ICIPE has made great strides forward in solving the problems of food scarcity in the area where it is located. The 1997 ICIPE annual report shows that the experiments of alternative management strategies for banana pests (weevils and nematodes) led to an increase in banana production, which was based primarily on using clean planting material. As a result, boll

weevil infestation was diminished from about 24% to 5% when healthy plants were used. Initially, the level dropped to 6% after the infected plantings were first cut and treated with hot water. Simple traps made from the split pseudostem were found to delay the boll weevil invasion by approximately 50% in susceptible banana crops.

ICIPE has also found success in transferring new technologies from the laboratory to the people through efficient and sustainable methods of disease control. For example, arthropod vectors (ticks, flies, mosquitoes, and fleas) carry some of the world's deadliest diseases. Many of these diseases are making a comeback as both the vectors and the parasites become more resistant to commonly used drugs and chemicals. Also, animal trypanosomosis and human sleeping sickness are transmitted through the bite of the tsetse fly (*Glossina* spp.). ICIPE tsetse traps were first developed and placed in use in Nguruman, Kenya, in 1996. The simple tri-color traps are baited with cow's urine and acetone and are strategically placed to control flies in areas where cattle graze. The traps also limit the invasion of the tsetse fly by forming an effective barrier against fly invasion from areas outside the control zone.

After twelve months of trapping, ICIPE social scientists assessed the impact of the trapping program. Milk production had increased by about 15% and herd sizes had increased between 25 to 55% from the previous levels. The promising results obtained in Kenya have influenced the Ethiopian government to approve a budget for the production of 2,000 additional traps a year in several regions of that country.

During the period of my internship under Dr. Herren at ICIPE, I worked with the recently launched African Fruit Fly Initiative. This project is directed toward promoting the productivity and trade of fruits and vegetables through management of African fruit flies. The ultimate goal centers around the increase of income and food supply for farm-based families as well as the increase of export earnings of developing countries by improving fruit and vegetable yields and quality. This can best occur through the use of affordable technologies to control the fruit flies which are the major pest of fruits and vegetables.

In 1995, the governments of Kenya, Tanzania, and Sudan, asked

ICPIPE to assist in developing a means to control the fruit fly. This led to regular sampling of both cultivated and wild fruits in four locations of Kenya for the purpose of identifying fruit fly species, composition, pest status, and their environment reservoirs.

While fruit flies attack a wide variety of fruits and vegetables grown in Africa, research efforts by necessity could not focus on all of the crops which are affected. Therefore, the African fruit fly project concentrated on the mango, which is an important smallholder crop that is grown for the local market and also for export. By the year 2005, the production and export demand for mangos is expected to increase by 50%. However, heavy levels of infestation by fruit flies reaches an average of 20 to 40%, which is the single most prominent constraint upon quality mango production. This leads to increased costs for the farmer and creates a hurdle for the growers who must comply with quarantine regulations and market quality standards. Consequently, fruit fly infestation drastically reduces African fruit grower's income and market competitiveness.

Throughout Africa, and especially East Africa, the fruit fly problem is severe; nonetheless, it remains neglected and is largely undescribed. Preliminary surveys conducted by ICPIPE, as part of the pre-project assessments, show that ninety thousand tons of mangos produced in Kenya were infected with fruit flies at a rate of 20 to 40% during the ripening stage of production. In some areas, such as Nguruman, infestation levels reached 80%. Other countries in the region, likewise, experience similar levels of infestation.

The lack of expertise to manage the fruit fly problem creates a major obstacle to the production of quality fruit in the region.

Notwithstanding the serious impact of the fruit fly, very little effort has been given to managing it. The larger fruit producers, as might be expected, have undertaken some measures to control the fruit fly, but little or nothing has been done by the small landholders who were interviewed. In an attempt to cope with the problem, the smallholders indicated that they tended to harvest their fruit early before it reached maturity to avoid infestation rather than preventing it through fruit fly management. Fruit

collected at that stage either is not infested or it contains only eggs of very young larvae which are inconspicuous and are consumed unnoticed. Ripe fruit, on the other hand, is largely utilized only locally at the village and is usually infested with fruit flies.

The rare attempts to control fruit flies were generally based on the use of pesticide sprays or, exceptionally, on the use of bait sprays. Most of these actions were not effective because the producers lacked basic knowledge about the biology of fruit flies and the process of managing such pests.

Adaptive research, training, and technology transfer must first occur before effective control of quarantine pests (fruit flies) can take place in the region. By using non-pesticide or localized low-pesticide fruit fly control methods, African fruit growers will be in a position to comply with the stringent zero pesticide standards. Efficient pest management and improvement of marketing systems will also allow small traders and smallholders to take advantage of the recent change in the international trade policies which, of course, will contribute to the alleviation of food insecurity.

My assignment as an intern was an integral part of the long range objective to describe and explore the practical implications of inter-specific diversity associated with fruit flies and their natural enemies in eastern Africa. Under the direction of Dr. Slawomir Lux, who was the African Fruit Fly Project Coordinator, I served as a scientific research technician. I worked with an applied biology graduate of Kenya Poly-tech, Peterson Ndeirtu. Because the diversity of tephritid fruit flies, their parastoids, their pathogens, and native host plants in Africa remain largely undescribed, Mr. Ndeirtu and I were given the responsibility of assessing and analyzing fruit fly population and dispersion in the Nguruman region. The mango producers contributed useful information and agreed to cooperate as we surveyed their orchards.

The data collected was then compiled into a computerized data sheet for further analysis and comparison. The samples collected of infested mango fruit and wild fruit provided excellent research material for biological and behavioral study of the fruit fly larvae. Needless to say, this is essential to any technical development of fruit fly management.

No matter how hard I tried to understand what the books were telling me, I never really grasped the reality of day-to-day existence in Kenya. Not until I was in Kenya, could I comprehend life in a developing country. It is a story of stark contrasts. City dwellers have the luxury of modern technology and conveniences such as televisions, cars, ATM machines, phone booths, washing machines, and computers with internet access. Rural inhabitants, on the other hand, live in a time gap often without electricity or running water.

In a discussion with a Kenyan school teacher who farmed in Nguruman, I learned about the farming methods practiced by the Kenyans in that community. According to him, Kenya's lack of food security is complicated and has several variables. Because Kenya is covered by dry savannah, the climate is not favorable for farming practices. Seeds for planting are often poor in quality since higher yielding seeds are too costly for small scale farmers.

The school teacher admitted that many farmers don't have the necessary knowledge for field maintenance or crop rotation. Subsistence farming, a concept very foreign to me, is the norm and often all that can be expected from a single farm. The broad idea of feeding a nation and not just your family is never considered.

In his opinion, the farmers are not hindered by lack of government support nor a problem of transportation. Rather, the major obstacle faced by the farmers centers on raising sufficient products to market. When he was asked how to reduce the hunger problem of Kenya, he suggested educating farmers to learn practices that would increase production.

As part of my work, I was assigned with other staff members to visit each mango farm in Nguruman. I especially remember a young boy near the age of 12, who led us on a tour of his mother's mango orchard. His friendly character and ability to speak English permitted me to communicate and ask him questions. In conversing with him, he expressed surprise to learn that I was only 18 years old. Based on my height and size, he thought I was 24 years of age or older. He asked if I am big, "because in every meal I get protein and nutrition." Without giving me time to answer, the young boy said they rarely get "that kind of food."

These experiences have caused me to re-think my opinions on

the problems of food scarcity. I initially thought that a large part of the hunger problem was caused by a lack of employment opportunities which translated into inadequate income to buy food.

Poor distribution and transportation of food further complicated the problem. However, these factors were considered both "fixable" and merely short term. The solution, I thought, could be found through the intervention of the wealthier western nations, specifically, the United States.

After a summer submerged in an environment which questions its own food security, I have developed a different point of view. Foremost, the issue of food security is far more complex than I ever imagined. Each factor or contributor to the problem is so integrally interwoven that in solving one aspect of the problem, others are created. Granted, employment and transportation are basic to Kenya's food security, but the high percentage of uneducated citizens weighs even more heavily on the efforts to rise above this problem. Basic schooling is often an unattainable wish for the many families who cannot afford it. Likewise, Kenyan farmers have little knowledge of modern agriculture. If they are to move beyond mere subsistence farming, they must learn alternative farming techniques which better utilize their land and available equipment. Cultural barriers, likewise, must be overcome; the human reluctance to change perpetuates established practices that limit the productivity of Kenyan farmers. Unless a different approach to farming is implemented, the prospect of increasing their food security remains bleak.

On a personal note, the two month internship at ICIPE benefitted me in ways that I cannot even begin to measure. This has given me insight and direction for future educational and career goals. Working at an international research institute with staff of differing nationalities has motivated me to pursue the study of international relations. More important, it has inspired me to continue my involvement in the efforts to overcome world hunger, specifically, in the area of Sub-Saharan Africa.

Amanda James
P. O. Box 17-42
Grinnell College
Grinnell, Iowa 50112

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