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EDUCATION'S ROLE IN SUSTAINABLE DEVELOPMENT: UGANDA'S KIBALE NATIONAL PARK

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ABSTRACT: Kibale National Park (KNP), located in western Uganda, offers a rich diversity of tropical flora and fauna. The Park's mid-altitude, moist tropical forest supports 11 of Uganda's 20 non-human primate species, some of which occur in very high densities. The region around KNP is home to seven national parks and numerous protected areas. Located within KNP is the Makerere University Biological Field Station (MUBFS), with an extensive 25-year research history and a mandate to assist KNP in protecting the ecosystems of the region through management-relevant research.

While KNP and MUBFS have received much visibility within Uganda, East Africa and the tropics as an important biological resource, both institutions face formidable obstacles in meeting their respective conservation mandates. For KNP, severe human population pressures around the Park, coupled with chronic shortages of capital, personnel, and other resources, make maintaining current Park resources problematic, let alone ensuring their long-term viability and protection. For MUBFS, declining donor support make it increasingly difficult to fund research programs and operations. Together, these challenges highlight the need for revenue-generating activities that can bestow direct and tangible benefits to KNP, MUBFS, and surrounding communities.

This paper examines the contributions that study abroad programs can make to resource protection efforts in the KNP region. Direct benefits include income generated through course fees, meals, housing accommodations, miscellaneous purchases, and staff and instructor fees. Indirect benefits include the increased awareness of the region's economic, scientific and ecological value by study abroad participants, local communities, institutions, and policy makers. Since the challenges facing KNP and MUBFS are common throughout Africa and much of the developing world, the issues and opportunities discussed here have widespread application.

INTRODUCTION

In the fall of 1995, the U.S. Agency for International Development (USAID) awarded a two-year Cooperative Agreement to the Consortium for International Development (CID) to promote the sustainability of a biological field station located within Uganda's Kibale National Park (KNP). The Makerere University Biological Field Station (MUBFS) had been the recipient of financial aid from various donors since its inception in the 1970s. Most recently, USAID had supported the Station and its programs.

The Cooperative Agreement specified three areas of technical assistance: infrastructure development, training, and marketing. These three activities were to be geared toward

increasing the Station's ability to self-finance its operations through increased Station use, streamlined operations, and the proactive solicitation of funds. Much has taken place at the Station since the contract was awarded in 1995. CID's program of infrastructure consolidation has carefully enhanced the Station's facilities by undertaking water development, electricity, and telecommunications projects. The Station's operating budget has been reduced by one-third while improving the level of services. Training has ranged from computer skills and accounting, to meal preparation and hotel accommodations. Aggressive marketing has increased the Station's visibility among research and training groups through dozens of presentations at professional meetings and various other promotional media like the Internet (via a MUBFS homepage), brochures, and newsletters.

This paper discusses how revenues generated by study abroad educational programs can complement broader conservation strategies designed to protect significant ecological resources in developing countries. It describes a trial course held at MUBFS in May of 1997, and details the Station's plans for expanded future course offerings. The paper also discusses how public-private linkages can be used to develop self-sustaining study abroad programs that can operate amid growing uncertainties over continued donor support.

UGANDA'S KIBALE NATIONAL PARK

Description and Significance

Kibale National Park (KNP) covers 766 km² (190,000 acres) in western Uganda—a region of great scenic and scientific value that is home to over half of Uganda's 10 national parks (Figure 1). KNP is representative of mid-altitude moist tropical forest, and offers spectacular scenery and extraordinarily high levels of biological diversity. The Park, managed by the Uganda Wildlife Authority (UWA), is situated within Uganda's primary tourist zone, and is adjacent to Queen Elizabeth National Park (QENP), the Mountains of the Moon (Rwenzori National Park), and Uganda's Rift Valley.

KNP has long been recognized as an ecologically significant area. The region was first gazetted as a Crown Forest in 1932 by the colonial British administration. Later, in 1948, Kibale was designated a Central Forest, and in 1964 a Forest Reserve. In November of 1993, the entire Kibale Forest, as well as a southern game corridor to QENP, were designated as Kibale National Park.

The Park's climate is tropical, with rainfall averaging approximately 1,700 mm per year (67 in/yr). Two rainy seasons occur—March through May, and September through November—with the northern part of the Park receiving more rainfall than the southern region. Minimum annual mean temperatures average 15° C (58° F), and maximum annual mean temperatures average 27° C (80° F).

Three major ecosystems form a mosaic of vegetation in KNP—forests, wetlands, and grasslands (Liliehalm et al. 1997a). The forests of the Park are classified as mid-altitude moist tropical forest. Trees reach over 55 m (180 ft) in height and form a semi-closed canopy of stratified tree crowns. An estimated 229 tree species are found in KNP—approximately half of Uganda's total. Important timber species listed as endangered include *Cordia millenii*, *Entandrophragma angolense* (naturally rare), and *Lovoa swynnertonii*. Non-timber tree species of economic importance include wild robusta coffee, *Coffea canephora*. Flat, low-lying areas in the southern part of the Park, which are often flooded, support thick stands of palms, including the Phoenix, raffia, and screw palms (*Pandanus* spp). In the extreme rocky and riverine

habitat of southern KNP, two rare species of cycads are found in isolated patches.

The fauna of KNP is one of the best studied in the tropics. Prominent are 11 species of non-human primates (two-thirds of the total for Uganda), including chimpanzee (*Pan troglodytes*) and the endangered red colobus monkey (*Colobus badius*). Terrestrial mammals include red and blue duikers, bushbucks, bush pigs, warthog, buffalo, water buck, the giant forest hog, sitatunga, and the African elephant. Carnivores include lions, leopards, golden cats, civets, palm civets, ratels, and the Congo clawless otter. Of the small mammals, rodents are diverse and abundant. At least 23 species of fish are found in the fresh waters of KNP, including air-breathing lungfish (*Protopterus aethiopicus*).

KNP's avifauna and invertebrate fauna are also very rich, and 325 species of birds occurring in 46 families have been reported in the Park. Those noteworthy due to their limited distribution include the olive long-tailed cuckoo, western green tinker bird, Willcock's honeyguide, collared apalis, red-faced woodland warbler, white-bellied crested flycatcher, blue-headed sunbird, and the Kibale Prigogine's ground thrush (*Turdus kibalensis*), which is endemic to the Park. Reptiles and amphibians are abundant in the Park, but little is known about them. The Park's invertebrates include an estimated 140 species of butterflies.

Makerere University Biological Field Station

MUBFS, located inside KNP, started as a small primate research facility in 1970. In 1987, the research Station became affiliated with Makerere University (MU), Uganda's premier university located in the capital city of Kampala. Today, MUBFS is a year-round field research station that can accommodate up to 65 researchers and trainees. Accommodations and services are available at reasonable rates, and include lodging (ranging from private to shared housing), laundry, phone, fax, e-mail, a library, and limited transportation and computer access.² Meals can be arranged, particularly for groups of 10 or more persons. Uganda's political stability, English language, and favorable climate make the Station readily accessible year-round, although some activities may be restricted during the rainy seasons.

MUBFS has two main research centers—Kanyawara and Ngogo (Figure 1). The Kanyawara site houses the Station's main facilities, with administrative offices, lodging, classrooms, a mess hall and kitchen, laboratory space, and a small health unit staffed with a nurse.³ The MUBFS library houses many books and periodicals, along with a collection of past MUBFS research. Kanyawara is also home to KNP's headquarters. Adjacent to the site is a grid of marked forest trails covering 15 km². Ngogo is a limited-use research site located a four-hour hike from Kanyawara. Accommodations at Ngogo are modest, and the site includes a second forest trail system covering 10 km². In total, roughly 200 km of trails are

maintained by MUBFS. The nearby Kanyanchu Visitors' Center offers opportunities for ecotourism research.

MUBFS and KNP are accessible by road from Kampala via Mubende (five to six hours). While this route is the shortest distance from Kampala, the last 110 km of the road is unpaved, and travel by four-wheel-drive vehicle is recommended, especially during the rainy seasons. An alternative paved route travels south through Masaka, Mbarara, Kasese (via QENP) and Fort Portal. Travel time is roughly eight hours from Kampala.

While MUBFS is a renowned primate research facility,⁴ the Station is actively seeking to expand the range of Station activities and develop into one of Africa's premier field stations. MUBFS encourages high-quality, multidisciplinary research and training activities that integrate the biological, physical, and social sciences. Proposals for training and basic and applied research are reviewed by the MUBFS research subcommittee. The Station particularly encourages proposals that include Ugandan colleagues and/or have application to KNP management. While the Station is typically near capacity during the summer months, more activities can be accommodated during the off-season from October through April.

Ongoing research projects conducted by local and international scholars include: (1) ecological and behavioral studies of a variety of taxa including primates, fish, birds, insects, and amphibians; (2) studies of forest regeneration in logged areas, under pine plantations, in grasslands, and on abandoned croplands; (3) long-term ecological monitoring, including climatic monitoring, chimpanzee demography, plant phenological patterns, fish population dynamics, and swamp and river limnology; and (4) socio-economic and socio-ecological studies, including studies of the effects of animal crop raiding.

Socio-Economic Environment

Nearly 60% of KNP's boundary borders heavily-populated villages, with the remaining areas bordered by QENP, tea plantations and wetlands (Lilieholm et al. 1997b; Whitesell et al. 1997). Overall, surrounding regions are densely populated, primarily by people from the indigenous Batoro and Bakiga ethnic groups. The region's dense population results from high birth rates and immigration from the populous Kabale and Rukungiri districts of southwestern Uganda.

About 90 percent of the population around the Park is engaged in subsistence farming. Bananas, beans, millet, sweetpotatoes, corn, cassava, and groundnuts are the principal crops. Occasionally crops are sold for income. Most land holdings are less than one hectare per family, and fields receive no purchased inputs. Some households have small woodlots (primarily eucalyptus, with some pine), and a limited number

of livestock. Because KNP has no buffer zone around its periphery, the villagers' fields share common borders with the Park. Human pressure on the land is greatest in the north, where a fallow system of one-to-two years is used to maintain soil fertility. Other activities include brewing of local beer, working in tea plantations and fishing in the southern portion of the Park.

Local communities have historically relied on the forest for a wide range of products and services, including logging, hunting, land for crops, collection of medicinal plants, firewood, poles, crafts materials, and the harvesting of wild coffee for income. The region's rapidly growing population, coupled with poor agricultural practices and political instability during the 1970s and early 1980s, led to illegal settlement in what is now KNP, especially within the former game corridor.

CONSERVATION OUTLOOK FOR THE PARK AND REGION

Uganda, once described as "The Pearl of Africa," experienced a wave of political instability under Idi Amin and others during the 1970s and 1980s that all but eliminated investment and tourism for a generation. By the 1990s, however, Uganda was rebounding from its earlier decline, with a stable government. The turn-around has assured the security of lives and property, and has also attracted foreign investment to the country. The country's resurgence contrasts with the growing instability and economic decline of neighboring Kenya and Tanzania. Tourism is growing 20% per year, and living conditions are improving—over the last 5 years, the percentage of Ugandans with access to clean water has more than doubled.

Increased tourism is significant for the protection of parks like Kibale for several reasons. First, tourist visits provide direct revenues for the country's parks. Second, tourism benefits local residents, thereby giving local communities a common interest with the Park's conservation mandate. But significant barriers limit Uganda's ability to increase tourism. These include the country's remoteness, a lack of capital for developing the infrastructure needed to attract and service ecotourists, and poor perceptions of Uganda due to past instability and a high rate of AIDS infection among the population. Additional challenges specific to KNP include the high human population density around the Park, and local residents' animosity over the loss of access to Park resources.

Before Kibale was designated as a national park, access to and use of the forest by local residents was not strictly regulated. Following national park designation in 1993, however, virtually all use of Park resources was curtailed, and people that had illegally settled in the game corridor were evicted and re-settled elsewhere. Moreover, elephants, baboons and other wildlife increasingly use the Park as a safe-haven from which

to raid the fields of surrounding villages. In short, local communities have borne the costs of resource conservation while receiving few if any tangible benefits from the Park. While Park regulations are intended to protect the area's natural features and wildlife, continued ill-will between the Park and local people may in the long run undermine the region's protection.

Although the creation of KNP in 1993 led to a prohibition on the collection of Park resources, the Government of Uganda (GOU) revised its policy and regulations for national parks in 1995 to encourage benefit-sharing and environmentally-sustainable use by local communities. In keeping with this new policy, KNP's recently-approved management plan includes local community participation in Park decision-making, and the provision that 20% of Park revenues be allocated to the Districts in which the Park is located. Moreover, the plan allows for the creation of collaborative management agreements (CMAs) between the Park and local communities to restore local access to some Park resources. Under the Plan's guidelines, border areas within the Park periphery have been designated as "Multiple Use Zones," where villagers can sustainably harvest resources under monitored and controlled conditions.

In addition to strained community relations, both KNP and MUBFS face severe financial limitations. Since their creation, both MUBFS and KNP have been highly dependent on outside funding from various international donors. In an environment where such support is increasingly limited, both institutions are seeking ways to diversify and expand their income sources. KNP and MUBFS have already taken actions to become more entrepreneurial. These include: (1) the submission of proposals for funding research and basic operations; (2) the design and production of various promotional items like t-shirts, posters and field guides; (3) active promotion of the Station and Park to potential users and tourist groups; and, more recently, (4) the expansion of training and educational programs at the Station. This last activity is described below.

HOW STUDY ABROAD COURSES CAN CONTRIBUTE TO REGIONAL PROTECTION

History of Educational Course Offerings at MUBFS

MUBFS is ideally suited for both field research and classroom instruction. Since the Station is situated within a national park, it operates like a "living laboratory" in a largely untouched natural environment. Here, classroom instruction makes the easy transition to field observation, located only a few meters away. And unlike East African savanna parks, where the presence of large carnivores limits visitors to buildings or their vehicles, KNP is visitor-friendly. One can walk through many kilometers of forest trails and touch, feel, smell, and hear the forest. Although primarily a tropical

forest, KNP also has large areas of grassland and wetlands. This diversity of ecosystems and their flora and fauna provides an unlimited range of educational opportunities.

For many years, MUBFS' facilities have been available to organizations that offered and managed their own courses, and took care of locating instructors and attracting participants. KNP's setting, combined with MUBFS' modest but adequate support services at affordable prices, attracted many courses from East Africa, Europe, and North America. Organizations offering regular courses include the UK-based Tropical Biology Association (TBA), the United Nations High Commissioner for the Refugees' (UNHCR) Environmental Program, The U.S. Peace Corps, The University of Florida, Makerere University, and others. Oftentimes, MUBFS staff and visiting researchers offered evening or guest lectures to supplement course instruction.

Although MUBFS continues to welcome such courses, these activities generate only modest income for the Station. Moreover, most courses are scheduled during the peak use summer months of June through August, when the Station is already near full capacity.

The MUBFS-sponsored Tropical Ecology and Management Course

In the fall of 1996, MUBFS began investigating the prospect of offering its own field courses. Offering courses was seen as a way to raise substantial revenues for the Station, while expanding use in the low-use season between September and June. Initial marketing research suggested that the course could be very competitive with current offerings. First, since this was a trial course, a limit of 24 students was set to make instruction and transportation manageable, while still generating a reasonable profit for the Station. The tuition was set at \$750 for the three-week course, with a lower rate of \$400 charged for African nationals. This covered all expenses from their arrival at the Entebbe airport (about 40 km from Kampala) until their departure (the participants paid their own air fares). The fee was substantially less than any other competitor's courses in Africa.

North American university students seemed most likely to attend, although course marketing reached all continents to some extent. While airfare to Africa was more expensive than fares to Central or South America, MUBFS could make up much of the difference through lower tuition. Moreover, course planners felt that there was a large segment of potential participants that wanted an African experience and would pay for it.

A one-page course announcement was developed and sent to groups and individuals on a 500-member MUBFS mailing list that had been gathered over the previous year. The list represented people that had visited the Station, or people that had expressed interest in MUBFS at various professional

meetings where lectures on KNP and MUBFS were presented. Listings were also placed on the Internet, and in various study abroad catalogs. Finally, up to 12 undergraduate or graduate credits were available from Utah State University's Division of Continuing Education for a recording fee of just \$10 per credit.

After six weeks of marketing the course, 24 participants were registered. Participants ranged in age from 18 to "40 something," and came from a variety of backgrounds. Most were college seniors or students in the early stages of graduate school. One each came from Canada, England and Australia, two from Uganda, and the rest from the US. All but two had strong interests in primatology. Overall, the group was diverse, very bright, and highly motivated.

Most of the instruction was provided by two MUBFS-based Makerere University Senior Lecturers with a combined total of 40 years of research experience in KNP. They were joined by a third instructor--a Conservation Officer from the Smithsonian Institute who had conducted his doctoral research at Kibale in the 1970s and donated his time and services to the course. In addition, four Makerere University graduate students provided assistance with field work and course logistics in exchange for a \$400 stipend and room and board during the course.

Benefits from Offering the Field Course

A student evaluation completed at the end of the course elicited much praise for the course. Comments included the course's inexpensive tuition and opportunities for university credit, the beautiful setting, friendly people, excellent food, outstanding instructors, etc. Many wanted MUBFS to offer an advanced course so they could return. Obviously, students were very pleased with what they had learned over the three week course. Some students also felt that the field experience would give them a competitive edge when applying for jobs and graduate school. For many this was their first visit to a developing country. The awareness generated by experiencing how so much of the world lives was a life-altering event. Moreover, the course's low fee, coupled with modest tuition, enabled many students to earn 12 credits in Africa for less money than if they had stayed at their host institutions.

MUBFS received many benefits from offering the course. First, the revenue generated by the course paid all of MUBFS' operating expenses for an entire month, and two MUBFS staff earned extra income as instructors. The Station also hired 5 to 6 extra persons from the community to provide support services, and four Makerere University graduate students served as student instructors, receiving valuable teaching experience, food and lodging for three weeks, and a stipend. Moreover, MUBFS staff gained the confidence that they can coordinate, manage and teach quality field courses on their own--an important step in institutional capacity building for

the Station. The Station also benefitted from re-establishing linkages with the Smithsonian Institute, and the goodwill generated by course participants.

Less direct but also important are the benefits MUBFS and KNP have gained through positive publicity generated by course participants. One student wrote a very favorable article about the course that appeared in the Bulletin of the Australasian Primate Society. Word of mouth advertising has resulted in many inquiries about future courses, and several participants have requested advanced courses and/or plan to return to Kibale in the future.

The KNP region has benefitted from the greater awareness generated by the course. In addition, villagers in surrounding communities earned income providing services for the group, and some of the participants extended their visits in Uganda after the course, thus contributing to the country's economy. Cultural events like a closing dance also created benefits for the community, as well as a greater appreciation of the region's culture.

Lessons Learned

MUBFS also learned some valuable lessons from offering the course. First, the course allowed the Station to refine its management with respect to housing, accommodations, and meals. Participants soon made it known that a larger breakfast would help them endure long hours in the field. The logistics of transportation, always filled with uncertainty in developing countries, lead to the creation of contingency plans. Flexibility in program design is also important. An unplanned weekend visit to the savanna ecology of adjacent QENP did little to help the program's overall finances, but generated considerable interest among course participants. Students also enjoyed a balancing of class and field time, as well as time off for seeing other areas of interest near KNP. Finally, the course evaluations provided many suggestions that will be incorporated into future courses.

The Tropical Ecology and Management course also highlighted some potential dangers of offering study abroad courses. First, agreements between all parties--from students to instructors-- need to be carefully thought out and agreed upon from the outset. Participants need to be fully advised of the risks of traveling in developing countries, and the need for immunizations, visas (if required), and medical evacuation insurance. The host organization also needs to be aware of any special dietary or medicinal needs of participants and visiting instructors.

On an institutional level, there needs to be a consensus that offering courses is beneficial. Ill will between established researchers and course participants can lead to conflict and a bad experience for everyone. Finally, institutions offering such courses need to be fully advised by legal experts to minimize potential liability.

CONCLUSIONS AND FUTURE PLANS

Offering study abroad courses can serve a valuable role in increasing regional sustainability. In the case of KNP and MUBFS, course offerings can be used to increase Station use during low-use seasons, and generate significant revenues for operating budgets and staff. Such courses can also increase recognition of the region's ecological significance at local, regional and international levels. Finally, study abroad courses can give institutions the entrepreneurial spark needed to successfully expand programs and reach self-sufficiency.

MUBFS is planning on offering several courses this year. The Tropical Ecology and Management course will be offered twice, and joined by a new course designed for primate keepers at zoological parks. Moreover, the Station has entered into a partnership with East Africa Studies Abroad (EASA), a private firm that facilitates the creation and marketing of study abroad opportunities in East Africa. EASA's involvement is self-funding from a percent charged on course fees. This directly links EASA's economic return to the course's success, and creates a self-financing partnership that is independent of outside donor support. Other plans for the future may include fee-sharing with KNP, and having selected KNP wardens participate as Teaching Assistants so they can receive additional training.

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² For more information contact the MUBFS Homepage on the World Wide Web at <http://www.usu.edu/~mubfs/index.html>.

³ Fort Portal is located 20 km away and has three medical facilities.

⁴ MUBFS has a long history of use by primatologists from Harvard, Yale, Duke, Purdue, The University of Michigan, The University of Wisconsin-Madison, and others.

Figure 1 is on the following page.

Figure 1. Management zones of Kibale National Park.

