

**KIBALE ECO-CHAR INITIATIVE
2012
ANNUAL REPORT**



**THE NEW NATURE FOUNDATION
STRIVES TO CONSERVE WILD ANIMALS AND
WILD PLACES THROUGH EDUCATION,
EMPOWERMENT, AND AN EMPHASIS ON
CREATIVE SOLUTIONS THAT PROMOTE PEOPLE
LIVING IN HARMONY WITH NATURE.**



**THE KIBALE ECO-CHAR INITIATIVE
AIMS TO DEVELOP A SUSTAINABLE AND APE-
FRIENDLY FORM OF INCOME GENERATION THAT
ALSO ADDRESSES THE CONTINUING FUEL WOOD
CRISIS, THEREBY COMPLIMENTING THE CONTINUING
WORK OF THE ORGANIZATION.**

Dear Staff and Board of the Arcus Foundation Great Apes Fund,

The New Nature Foundation is honored to present you with our 2012 annual report for the Kibale Eco-Char Initiative. The KECI was, in a way, a leap of faith for NNF and it gives us great pleasure to report that we have landed safely and on solid ground! While other conservation initiatives exist within the villages where NNF operates, nothing this different from the norm had been attempted, nor had we witnessed any conservation work in Uganda flourishing in such a short amount of time. While much more can and will be achieved within the next few years, the beginning of this endeavor has already led to tremendous wood savings, much of which would otherwise have been taken from within the chimpanzee habitat of Kibale National Park. The technology introduce also has a positive effect on climate change and has empowered a number of communities with what they can do with the waste in their own backyard.

Within this report you will find a detailed account of all project activities, sponsored almost entirely by Arcus Foundation funds. The Arcus Foundation's support was the impetus for this change around Kibale and NNF is thrilled to be carrying out this work. We treasure the relationship that we have built with the Arcus Foundation over the seven years that we've been working in KNP and hope you find the results below as exciting as we do!

Thank you very much,

The image shows two handwritten signatures in cursive. The first signature on the left is 'Rebecca Fulstone' and the second signature on the right is 'Michael'. Both are written in black ink.

Becka and Michael

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Project Title: Kibale Eco-Char Initiative, 2012 (KECI)

Location: Communities surrounding Kibale National Park, Uganda (KNP)

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The Kibale Eco-Char Initiative was instituted to find a proactive solution for the fuel wood crisis by focusing on creating eco-briquettes to entirely replace the need for wood. The program began in July 2011 and continues to the present. This report examines the work through December 2012.

The stated goals of the KECI for the timeline of this grant were:

1. To better protect the chimpanzee habitat of Kibale National Park through the adoption of eco-briquettes by people living around the borders of the protected area.
2. To introduce briquette making as an income generating activity for individuals living around the boundary of Kibale National Park.

Highlighted results:

- **71 families are now cooking with briquettes**
- **In 2012, the KECI produced 67,886 biomass briquettes**
- **The total amount of briquettes accounts for a savings of more than 15,274 kilograms (33,603 pounds) of wood, much of which would have come from the chimpanzee habitat of Kibale National Park.**

Briquette Production

By early 2012, the five best briquette recipes were established after testing more than 20 possible mixtures. The briquettes, reminiscent of a donut when complete, are made from waste materials such as peels from bananas, potatoes or yams, and peanut shells, avocado pits, recycled paper, saw dust, and whatever other suitable waste items become available seasonally. Eleven recipes have been refined that produce the most efficient briquettes with varying waste products. Two of the recipes also contain seeds of the castor oil plant, which can be found in limited quantities within the village. Castor seeds are known as the “local kerosene” due to their high oil content, and they help the least flammable waste products burn nicely. While the Kaburala facility makes all the briquette recipes, the Kiko facility (located at the Kiko Tea Estate) produces briquettes made solely of their industrial waste – sawdust, tea remains and paper. The briquettes being produced can boil water in the same time as wood, and though they are slightly more smoky than charcoal in the early stages of burning, they are less smoky than wood and compare favorably with charcoal after a few minutes.

In 2012, the KECI produced **67,886 biomass briquettes**. The Kaburala factory is the main hub of the operation, with the staff of seven working four-five days each week deconstructing materials and creating briquettes. The Kiko briquette production started after a rumor of the Kaburala facility spread to the estate. Recently accredited by the Rainforest Alliance as having sustainable operations, the estate manager needed to find a better way to deal with the waste produced if he wished to maintain that accreditation. There are more than 500 staff members at Kiko, most earning about \$1 each day. A partnership was born whereby KECI staff provides guidance, oversight and consultation to Kiko while the estate provides the Kaburala facility with sawdust and paper from their factory. To maintain collaboration, frequent visits occur so staff stays aware of modifications or challenges that occur at each facility. There are currently five staff producing briquettes at Kiko, though they work only ½ days as workers are needed in the fields and factory for their primary duties. In 2013, the manager of the estate has insured us that he intends to devote more staff time to briquette production. We plan to continue working with the estate and motivating the manager until they are producing enough briquettes to provide all staff and sell surplus briquettes in Fort Portal.



Jane Kobisingye, manager of Kiko Kuchumbrick Factory

Briquette production in the village (without electricity) is a labor-intensive task (as you can see for yourself in the videos on our website), and several things were attempted to ease production in 2012:

First, an improved drying tent was constructed. (A prototype proved successful last year, encouraging a more permanent structure this year.) Since rains were very unpredictable throughout 2012, briquettes were taking a long time to dry. Building a greenhouse-like structure for the briquettes not only sped the process along but also eased the burden on staff by reducing the need to move the briquettes into the sun each day. Breakage of briquettes was also reduced with the addition of the drying tent. A second tent was built at the end of 2012. Kiko built a tent after it proved successful in Kaburala and is planning on a second (much larger) tent for 2013.

Next, various contraptions were experimented with for processing waste. At the first, all waste was processed by hand using traditional mortar and pestle. This takes a long time! A hand-powered meat grinder seemed promising at first for the softer waste products, and it was attached to a bicycle to speed the process even further. However, soon after the machine was subjected to constant use, maintenance proved more time consuming than hand pounding, so the grinder was abandoned. A similar process occurred with a hand-powered grain grinder, which was tried for the dry waste products but ultimately did not work. Currently, peanut shells are driven to Fort Portal and ground on flourmills, an affordable and time saving answer for this ingredient. Many other machines in Fort Portal were experimented with (including peanut-butter makers and chicken-feed grinders), but none could handle the moist waste. Indeed, this is a problem encountered with other biomass-energy programs around the world. Some projects dry all waste and then process it similarly to our peanut shells, but this is not feasible in Kibale, where the rainforest habitat ensures that things do not dry easily.

The drying issue raised its whiskered head again during storage of the briquettes and waste. At first, all materials (raw and finished) were kept in the same area. This practice attracted rats, who were happier eating the finished briquettes than the raw materials they were accustomed to eating! Now, additional space has been created such that the dry materials are stored separately from the wet materials, and both are kept separate from the finished briquettes. The rat problem has been dealt with successfully for the time being.

In 2013, we hope to mechanize more aspects of the work. A generator and industrial food processor have been purchased for the Kyanyawara facility, and we anticipate that this will vastly speed production capacity.

Trading for Briquettes

71 families are now cooking with briquettes at our two production facilities. One family is cooking entirely with briquettes because neighbors are allowing them to collect waste from their land (their story can be found in the winter 2012 update).

Surveys and calculations show that an average family would need approximately 40 briquettes each day to cook tea and two meals. Based on the average amount of wood used daily, the total amount of briquettes accounts for **a savings of more than 15,274 kilograms (33,603 pounds) of wood.** While much of this wood would have come from unsustainable sources, the briquettes are 100% carbon neutral, so in addition to protecting wildlife habitat the KECI is helping us all by mitigating carbon emissions and climate change.

Like all other aspects of New Nature Foundation's work, personal investment is required from our stakeholders. Briquettes are not given away to people but traded for the raw materials needed to make them. For every 10 kilograms (22 pounds) of waste brought to the production facility, 40 briquettes are provided.



A family participating in the trading program

Our partners at the Kiko Tea Estate are taking a slightly different approach: Since waste products are readily available at their factory, briquettes are provided free of charge to their employees, in an effort to curtail theft of the estate's eucalyptus wood (used for drying the tea) and help conserve the natural forest fragments that still remain around the plantation.

Our surveys revealed that 18% of Kiko staff use only charcoal for cooking, with an additional 19% using charcoal some of the time. With this level of charcoal use much higher than what is typically seen in the village (KFWP surveys reveal that less than 1% of our constituents in the village use charcoal), we are hopeful that adoption of the briquettes will be even easier, since cooking with them is more similar to cooking with charcoal than it is to cooking with wood.

Most of the data were collected on the 26 families trading for briquettes at the Kaburala facility. The ten families that worked with KECI since January 2012 or earlier averaged 11.4 visits during 2012. The number of visits was dependent on the amount of waste people had to trade, which in turn was linked to farming conditions. At some times of year, when matooke bananas or peanuts were plentiful, for instance, partners came more often with more waste. At other times of year, staff reported that partners were not coming as often, partly because they were embarrassed to show people the waste of the foods they

were eating. That is to say, during periods of relative famine people were eating everything and anything available (i.e., unripe foods, overripe foods), and they do not want other members of the community to witness this hardship. In 2013, to encourage trading at these lean times of the year, we will continue to fine-tune the amount of briquettes given per kilogram of waste. It is likely that we will adopt a sliding scale – when fewer people are trading, more briquettes will be given (50 or 60 per 10kg of waste). When more waste is available, the standard 40 briquettes per 10 kg will be given.

On an average visit, partners brought 40.6 kilograms (89.3 pounds) of farm waste to trade for 162 briquettes. Rather than using up the briquettes quickly by cooking all meals with them, the reality of the situation is that cooks prefer using briquettes for certain foods more than others. The average partner uses 16.3 briquettes to cook one meal for 6.8 people each day until they run out of briquettes.

The KECI had a long-term volunteer through it's pilot phase, Savannah Schulze, who was a tremendous help in getting this project off the ground and training staff in data collection.

Stoves & Training



A woman with the fuel-efficient briquette stove in the foreground and the efficient wood stove in back

To maximize the efficiency of the briquettes, several stove designs were experimented with. Designs promoted on the internet for briquettes were attempted, but with the materials available in the village, these stoves were not very effective. The efficient charcoal stoves now becoming available in Kampala and Fort Portal, though, actually work very well with our briquettes. As reported last year, through copying certain aspects of these stoves and modifying the rocket stove design that has been promoted via the KFWP, an efficient and locally replicable briquette stove has been refined. This same stove is still considered the best model and is being promoted for all trading partners.

Along with mud and dung, the briquette stove requires one brick with holes in it, which serves to elevate the briquettes and supply oxygen from below. These specially made

bricks are available in Fort Portal and cost about 20 cents each. When new partners wish to join the project, they are given one of these bricks if they agree to provide the rest of the materials for the stove on their own.

New partners also undergo training from project staff, both in a group with other new partners and one-on-one, as they are guided in building their stove and cooking their first meal with briquettes. In addition to the new partners that joined the project on their own (after becoming interested by seeing the work progressing as they pass by on the road), a second group of interested individuals attended group training in May where they experienced the production process and cooked with briquettes while learning about the trading process. All cooks are asked to keep records of how they use the briquettes as the KECI is still learning the intricacies of this new fuel source.

In addition to focused training sessions, partner cooks were invited to compete in the third yearly efficient cooking competition. Previous years included ten chefs with efficient wood stoves, all vying to cook the tastiest beans using the least amount of wood. This year, in addition to those ten chefs, ten entrants used no wood at all to cook their beans. Local volunteers monitored every step of the process, insuring honesty and timeliness, and in the end the assembled crowd of over 300 people were amazed to find that the beans cooked on briquettes tasted every bit as good as those cooked on wood. The winner used only 14 bricks to cook 1 kilogram of beans, an admirable feat.

Wood Extraction Survey

Personal observation of firewood collection inside Kibale National Park is one of the main reasons that the KECI was initiated. Even after several years of promoting fast-growing trees and efficient stoves through the Kibale Fuel Wood Project, the large groups of school girls seen collecting immense bundles of firewood inside the national park made it clear that something else was needed to help ease the burden on chimpanzee habitat.

Data is being collected about the direct benefits of KECI's briquettes (e.g., the numbers produced and used, how much wood this translates to), and these are detailed elsewhere in this report. None of these data prove that the project is protecting chimpanzee habitat, though. To serve as a baseline evaluation, a wood extraction survey was conducted inside Kibale for the first time ever in 2012, thanks in part to Arcus support.

Initially planned to be conducted in partnership with students from McGill University, NNF Advisory Board Dr. Member Colin Chapman suggested we work with the Uganda Wildlife Authority (UWA) instead. As mentioned in the initial application for funding, UWA has partnered with NNF since our earliest programs began in 2001. Joining forces with them for an extraction survey, Chapman suggested, might help this government agency appreciate more fully the damage that is being inflicted on wildlife habitat by small-scale collection of wood. Precipitating Chapman's suggestion was the fact that UWA Warden of Research and Monitoring for the Kibale Conservation Area, Richard Muhabwe, was planning to write his Master's Thesis on topics that include wood collection. (Muhabwe is studying under Dr. Jessica Rothman of Hunter College of The City University of New York.)

Arrangements were made to contribute the funding received from Arcus for this purpose to Muhabwe's research effort, and for six months in 2012 he and his assistants conducted a survey of all human activity inside Kibale at six different sites.

At each of the six study sites, two 2-kilometer transects were walked twice each month. One transect was 30 meters inside the park boundary; the other was 500 meters, deeper into the forest. Signs of human activity were recorded if they were observed within 2.5 meters on either side of the transect line. Types of activity recorded included firewood collection, pole cutting, illegal grazing of animals and the collection of two plants (*Prunus africanus* for medicinal uses and *Piper guinensis* for use as a spice). At NNF's request, four of the six areas monitored for the study are target areas of the KFWP, with one, Kyanyawara, also being the site of KECI's pilot work.

Results of the initial survey are shown in the table below. Kyanyawara showed the highest incidence of all human activities except grazing. Not only was this true along the boundary, but also along the interior transect. These data highlight a few things: First, choosing to begin the KECI's work in Kyanyawara rather than another one of NNF's target areas was a wise choice – firewood is obviously in high demand in the area, so much so that people are traveling farther into the park to collect it than anywhere else. Muhabwe attributes this high level of collection to the fact that there is little to no buffer zone in Kyanyawara. Thus, to make the greatest impact on protecting chimpanzee habitat, NNF may want to consider other areas with little or no buffer if and when the KECI's activities are expanded.

Surprisingly, charcoal production was not seen. Personal communication with local citizens shows it is considered common knowledge that charcoal is being produced inside the park. However, while park guards often turn a blind eye to illegal wood collection (perhaps because they realize that there are few other sources of cooking fuel available), charcoal production is frowned upon. With telltale pillars of smoke rising from a production site for several days, this is likely occurring farther inside the park than this survey recorded, in order to avoid detection. While firewood and pole collection is typically for personal use, charcoal produced is sold in the nearby town of Fort Portal. Therefore, to make a positive impact on both of these forms of habitat destruction, the KECI will need to continue following two paths – supply of briquettes to the poorest of the poor along the boundary (who would otherwise be using firewood from the park) and sale of briquettes in competition with charcoal in urban areas. We do intend to continue along both these paths – please see more details under the “Poverty Alleviation” and “Future Plans” sections, below.

Table: Signs of human activity in Kibale National Parks in edges (30 m) compared to interior forest (500 m)

	Ka Edge	Ka Int	Is Edge	Is Int	Se Edge	Se Int	Ku Edge	Ku Int	Kh Edge	Kh Int	Ki Edge	Ki Int
Human Activity												
Pole cutting	5	2	2	0	2	0	1	0	1	0	1	0
Fire wood collection	4	1	1	0	1	0	1	0	1	0	0	0
Debarking Prunus	10	0	0	0	0	0	0	0	4	0	0	0
Piper guinensis	1	0	0	0	0	0	0	0	0	0	0	0
Illegal grazing	0	0	0	0	0	0	0	0	0	0	4	0

Ka=Kyanyawara; Is=Isunga; Se=Sebitoli; Ku=Kanyanchu; Kh=Kahangi; Ki=Kinyantale

Our own surveys around the Kiko Estate also reveal a high level of wood collection inside Kibale: 9% of the total number of families surveyed (12% of those who cook with wood) admit to collecting it within the national park. Additionally, 46% (60% of those who use wood) say they take wood from the “Kiko Forest”. While some of these respondents may be referring to the eucalyptus trees grown by the factory for drying tea, some may be referring to the natural forests still present within the tea estate, which are still utilized by chimpanzees and other wildlife.

Poverty Alleviation

To make the KECI a true success, both of the methodologies described above will need to be followed: The poorest of the poor, currently collecting firewood inside Kibale, do not have enough money to purchase fuel. For them, the time savings and health benefits of cooking on briquettes will lead to greater income generation in their other pursuits (farming, working in the park, etc.). Those who were already growing firewood at home may even be able to earn a small income by selling this rather than using it. For these reasons, the KECI will continue its village trading scheme, even though it may not ultimately be as beneficial in terms of volume of briquettes produced and amount of income generated.

The model being followed at the Kiko Tea Estate includes two avenues for poverty alleviation. Surveys conducted reveal that 37% of tea workers (who earn about \$1/day) purchase at least some of their cooking fuel. Those who purchase all of their fuel spend approximately \$2 weekly on the fuel. By teaching the factory how to supply its workers with fuel produced from industrial waste, the effective income of these workers has already been raised. Because the production at the factory is not limited by many of the issues encountered in the village, we think it will be possible to vastly scale-up production. At that point, surplus briquettes could be sold in nearby urban areas for less than the corresponding amount of charcoal, thereby bringing the money-saving benefits of briquettes to even more people. This aspect of the work especially excites us, since tea production is one of Uganda’s main sources of revenue. With dozens of tea estates across

the country, the possibility exists to make a measurable difference in charcoal consumption, habitat destruction and poverty in areas bordering ape habitat in Uganda.

In the seven years that the project directors have been working on fuel efficiency programs around Kibale, we've seen that cultural practices can take a long time to change. Even with firewood being more scarce than ever before, people like seeing large fires and cooking their food longer than is needed, simply because that is the way they have always done it. While we've witnessed adoption of efficient stoves through the work of the KFWP, using them to their greatest efficiency is only now starting to be seen. In contrast, in only 18 months of operation of the KECI we've seen a true embracing of this new technology. Many of the cooks tell us that they would happily cook all of their meals on briquettes if they had more available to them. Hopefully, with the increased production anticipated through the various changes detailed elsewhere in this report, we will be able to provide Kibale's neighbors with as many briquettes as they need, weaning the population from wood completely and protecting habitat of chimpanzees and other wildlife for years to come.

Capacity Building

In addition to presenting six lectures at institutions and private parties about NNF's work in Uganda, the generosity of the Arcus Foundation in supporting the Giving Tuesday concept allowed us to expand our donor base here in Denver and spread the word of the Arcus Foundation's ape conservation work to a larger audience. Hosted by the Infinite Monkey Theorem Winery, a company that uses a drawing of a chimpanzee as its logo, the attendees were wine lovers and animal lovers both. The event was advertised by the winery and also garnered a mention in the Denver Post. A silent auction, craft sales, children's art show and African drummers all made it a memorable evening, and in the end \$11,634 was raised in support of the KECI.

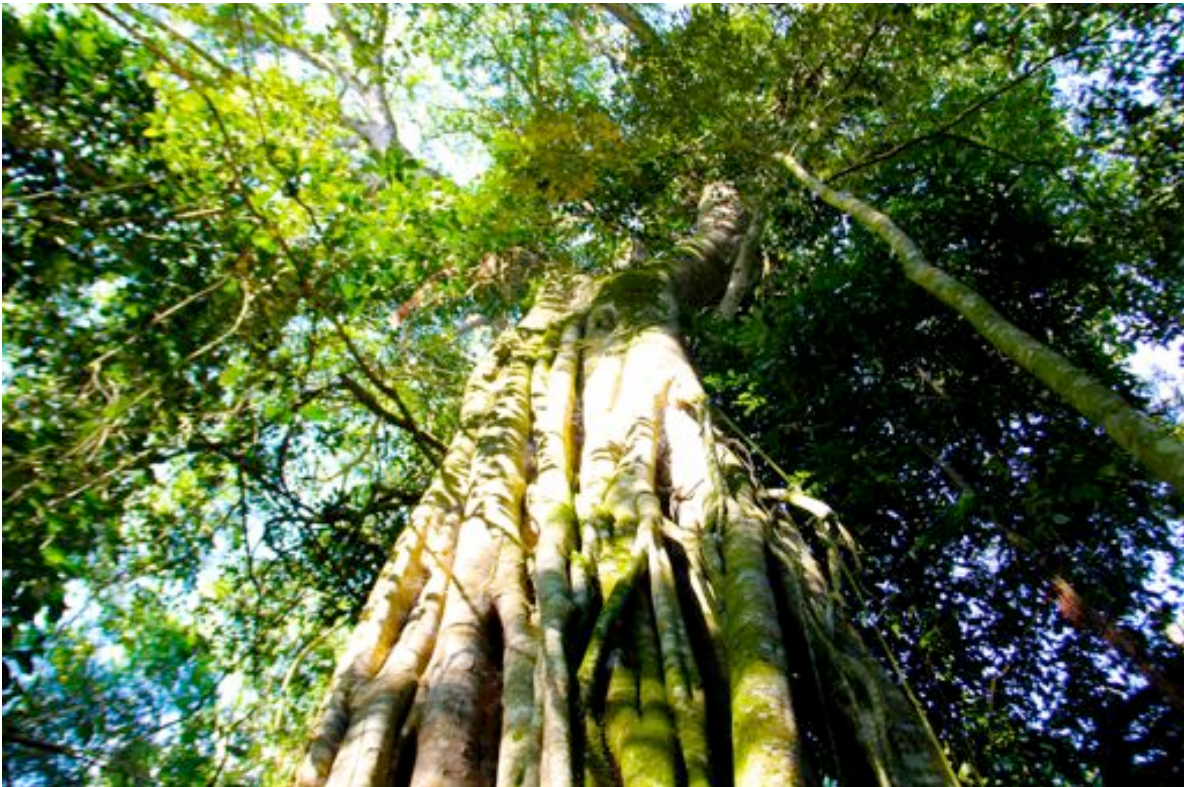
While obtaining donations for the silent auction, we were able to make good contacts with many local merchants who are now interested in the work and committed to helping with future events. One of the art teachers who helped organize the children's show (with artwork focused on chimpanzees and the rainforest) is now applying for a grant to come teach with us in Uganda, and one of the other partygoers has made an additional donation to us since the event. Overall, we feel it was an excellent use of funds that will benefit the KECI greatly in years to come. Several more speaking engagements are already booked for 2013 and we are considering hosting another Giving Tuesday event.

While the Arcus Foundation funded 100% of monetary expenditures for the KECI in its first six months (in-kind donations were also made by Idea Wild), in 2012 the circle of support for the project also included a handful of other supporters: the Denver Zoo Conservation Fund, Edelman Community Investment Grant, Oakland Zoo Conservation Fund, Sophie Danforth Conservation Biology Fund and private donors together contributed \$7,993.55 to bolster the support given by the Arcus Foundation. In 2013, all of our donors have been asked to contribute toward the KECI as well as the KFWP, and we look forward to the work that will be possible with this increased base of support.

The Future

In 2013, NNF plans to use all the information gathered during the KECI's pilot period to maximize the potential of both the village and factory methodologies. As mentioned above, so much progress has been made in just 18 months, but rather than expanding immediately we feel it wise to continue perfecting the technology in the different work areas. A lot has been gained during this pilot phase, and momentum is pushing the entire staff to continue striving for success. Bringing electricity to the village in the form of a modern, fuel-efficient generator will be an exciting moment. Demonstrating how a small infusion of electricity can save tons and tons of firewood will be groundbreaking. The Kyanyawara and Kiko communities have once again proven to the New Nature Foundation that, given guidance and training, Ugandans can be extremely enthusiastic conservationists. We are very hopeful that the Arcus Foundation and other institutions will continue to see the benefit of this program so that we are able to continue funding this truly inclusive and effective community conservation project.

Thank you for your support! The KECI would not have begun without your assistance, so NNF, the community members and Kibale's chimpanzees are very much indebted to your generosity and dedication to ape conservation in its many forms.



Strangler Fig, Kibale National Park

KECI 2012 Budget

EXPENSES Category	Total Year 2 BUDGETED Amount (\$)	Arcus Request Year 2 RECEIVED Amount (\$)	RECEIVED Other Donors	Total Spent Amount (\$)
A. Staff Positions (with FTE noted)				
Eco briquette team	\$8,200	\$4,800	2,860.73	7,660.73
Project Manager	\$664	\$664		688.00
Project Directors	\$6,000	\$6,000		6,000.00
Volunteer (International) Monitoring Staff	\$3,077	\$1,518		1,494.00
<i>Subtotal Staff</i>	\$17,941	\$12,982		
<i>Staff Total</i>	\$17,941	\$12,982		15,842.73
B. Consultants/Contractual Services				
<i>Consultant Total</i>	\$0	\$0		0.00
C. Direct Program Costs				
Printing and Postage	\$510	\$510		510.00
Meeting Expenses	\$510	\$510		510.00
Supplies	\$2,078	\$1,867	487.36	2,354.36
Travel: International	\$4,160	\$4,160		4,160.00
Travel: In-situ	\$3,618	\$2,254	4,000.00	6,254.00
Rent for storage facility	\$150	\$150		150.00
Capacity Building	\$1,200	\$836	364.00	1,200.00
In-situ living expenses	\$2,032	\$867	281.46	1,148.46
<i>Direct Pgm Total</i>	\$14,258	\$11,154		16,286.82
TOTAL EXPENSES	\$32,199	\$24,136	7,993.55	32,129.55

Budget Comments

While most of the budget items were close to expected amounts, in-situ travel is \$4,000 higher than initially budgeted. The KECI makes use of the Kibale Fuel Wood Project vehicle and initially we'd budgeted for fuel and upkeep of this vehicle. However, by mid-2012 the vehicle had taken a turn for the worse and could no longer perform as needed. A "new" (imported used from Japan) vehicle was purchased, with costs shared by KECI & KFWP budgets. Financial constraints necessitated the purchase of a Toyota Hi-Ace rather than a Land Cruiser, as would have been desirable. The Hi-Ace is spacious and has 4 wheel drive, so will serve our needs for the time being, but this vehicle may be traded in for a newer Land Cruiser if funds become available since this type of vehicle will last longer on the poor roads we routinely travel on.