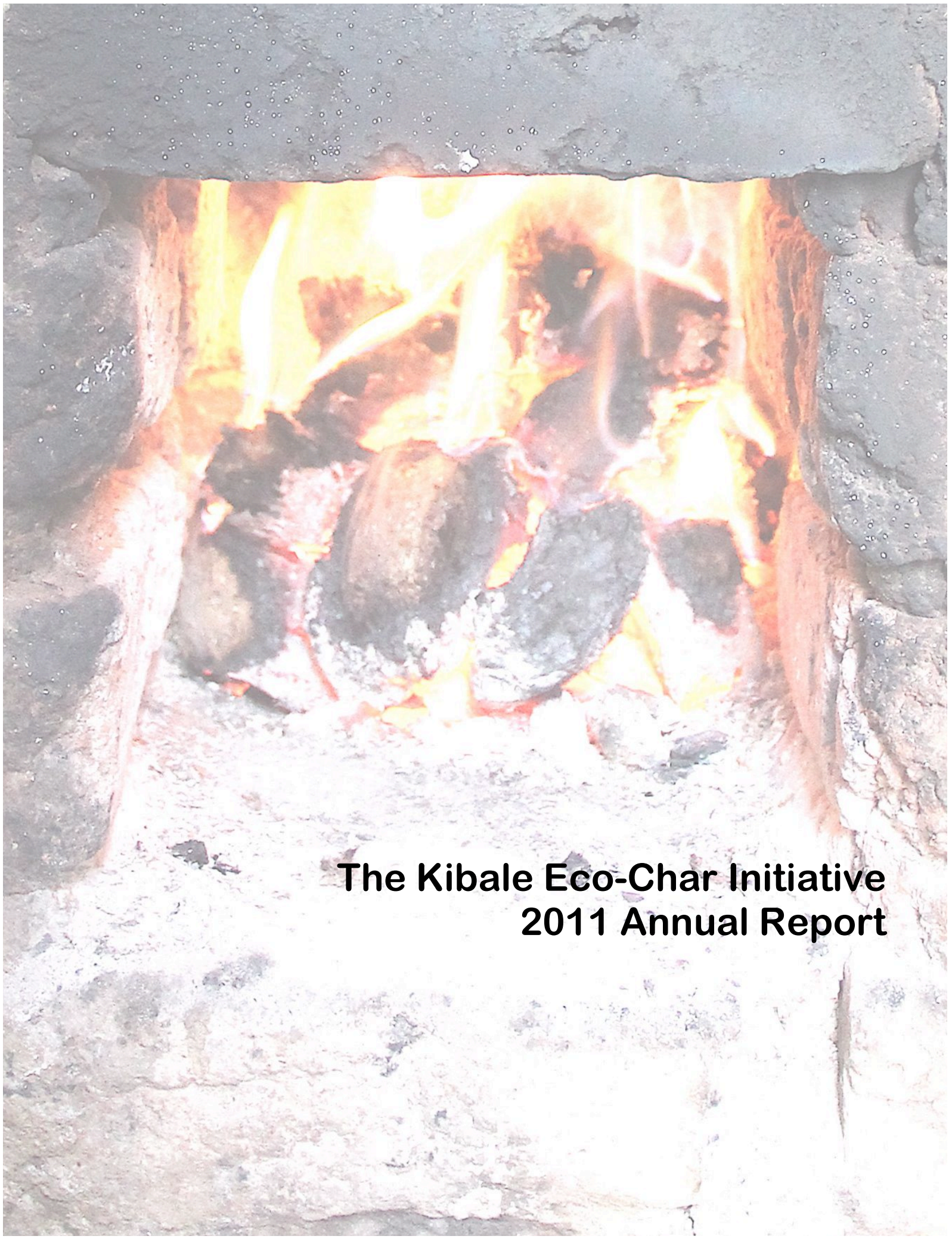


The Kibale Eco-Char Initiative
2011 Annual Report

New Nature Foundation

As we put together this annual report, we became more and more excited about what has been accomplished in these short months since beginning the Kibale Eco-Char Initiative. We hope that the descriptions and photographs in the report tell the story of how the KECI began with an idea that blossomed into the actualization of its goals. The KECI is currently creating briquettes and using the trading scheme it intended to implement in 2011. Hopefully, you too will begin to smile as you see the photos of the briquettes producing a magnificent fire!

Through massive unexpected rains, many trials and errors and many bags of less than desirable contents, thanks to our dedicated staff the KECI is well on its way to creating a real change for the communities around Kibale National Park that strengthens the protection of Kibale's wildlife, including its endangered chimpanzees.

Within the Batooro tribe people are given an endearing nickname. Having been embraced by the culture, the briquettes have received one as well: "Kuchumbricks," originating from the Rutooro word kuchumba (meaning to cook) meshed together with the word brick.

The New Nature Foundation is thrilled to produce this first annual report and we hope it inspires you as much as does all of us. Tremendous thanks goes to the Arcus foundation Great Apes Fund for completely financing the first year of the KECI, and to Idea Wild for in-kind donations.

Sincerely,

Rebecca Goldstone & Michael Stern
Founders & Project Directors, New Nature Foundation

The KECI team (from left): Florence Kengonzi, Margaret Kemigisa (Manager), Margaret Tusiime, Savannah Schulze, Annette Katusabe. Kneeling: Daisy Kuzaara

Kibale National Park in Western Uganda is home to Africa's densest primate population, including about 1,400 Eastern chimpanzees, *Pan troglodytes schweinfurthii*. Tragically, unsustainable firewood collection is seriously threatening this stronghold of the species. **The Kibale Eco-Char Initiative (KECI) addresses the demand for fuel by offering alternative solutions for people's energy needs. The project uses readily available waste products to produce biomass fuel briquettes, launching the possibility of weaning Kibale's neighbors from wood and charcoal completely, thereby safeguarding the area's chimpanzees and other wildlife.**

STATED GOAL: By the end of the first year, briquettes and stoves will be refined and a system for trading waste for briquettes will be established.

The KECI has met this goal through the process described below.

1. Identifying Readily Available Waste Materials

It was important to first determine what is actually considered waste in the village. Most inedible biomass and food scraps are used to feed livestock or serve as compost on farms. Other items are used as bedding for chickens, and corncobs and reeds are already being used as alternatives to firewood. After researching the usage and availability of village waste, we determined the following products would be available (in varying degrees) for making kuchumbricks:

Avocado pits (below left); yam/cassava/potato/banana peels; peanut shells (below right); cow/goat dung; castor oil seeds; dead leaves; saw dust (from local sustainable plantations); and, waste paper (from field station researchers and other facilities).

2. Testing Various "Recipes"

A number of criteria were established to define a successful briquette: The ingredients needed to bind together well enough to form a briquette; once pressed and dried, the ideal briquette would light easily, produce a flame at first and then smolder like charcoal (instead of burning quickly or merely smoking); briquettes also needed to hold together well enough to be transported.

KECI staff ground, soaked and mixed all the ingredients listed above in various combinations and ratios to examine which blend would work best. We were also careful that no recipe be too reliant on any single ingredient, as we were unsure how frequently and in what amount specific waste items would be available.

It quickly became clear that including a small amount of castor oil seeds helped bring about the desired flame, and at least some paper was helpful in binding all other ingredients. Peanut shells burned hot, while sawdust helped produce embers that continued glowing for a long time.

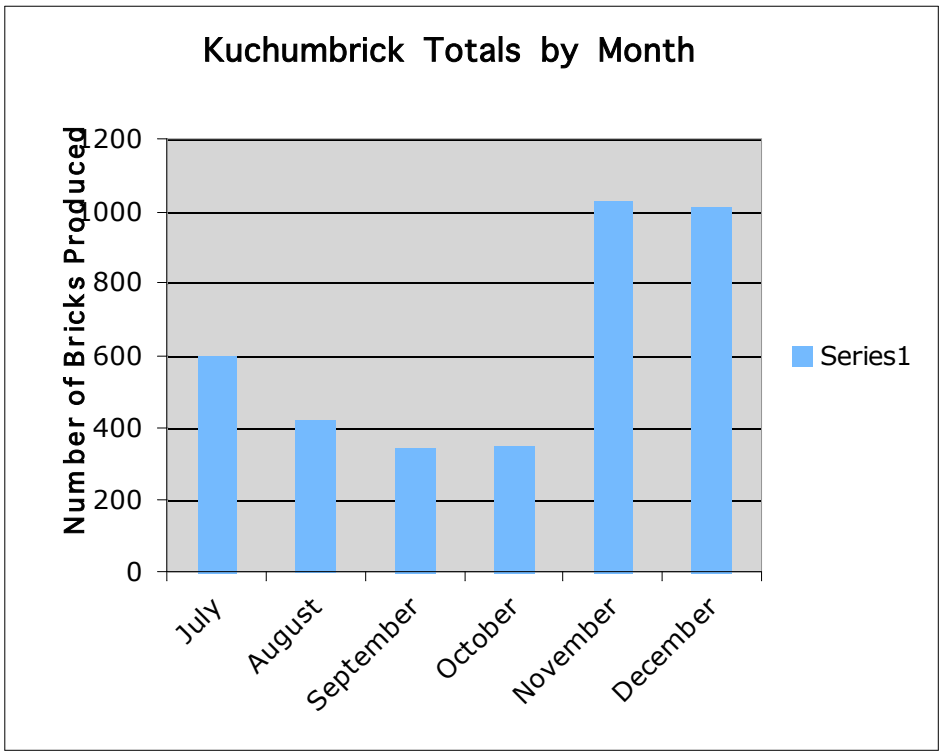
Numerous trials were conducted comparing the briquettes to one another and to wood and charcoal. Time needed to boil a liter of water was noted, as was smoke production and other variables. We tried over 20 different recipes to determine which briquette was the most efficient, ultimately settling on 7 different mixtures that produced the desired results.

3. Refining the Stove

Since the briquettes burn similarly to charcoal, efficient charcoal stoves were used during the testing period (pictured above). However, the majority of local community members cannot afford charcoal stoves. The rocket stove being promoted by the KFWP was tested and found to be functional but not ideal for cooking with kuchumbricks. Designs promoted on the internet for use with briquettes were tried, but the locally available materials were not perfect for constructing these stoves and the results were sub-par. A shorter version of the KFWP rocket stove was designed, incorporating certain aspects of store-bought charcoal stoves. Made from mud, dung, ash and sand, the stove pictured below maximizes the efficiency of the briquettes. The second picture commemorates the first meal ever prepared in Western Uganda with kuchumbricks!

4. Producing the Briquettes

Figure 1, below, details how many bricks were made each month, July-December 2011.



The KECI began with a small workspace in a section of the farm at one of the Kibale Science Centers. Soon after beginning production we encountered three problems: rain, lack of storage and rats. The plan of using drying racks out in the sun was reliant on sunny weather. Unfortunately, rains stared in June last year and did not stop until mid December. This is not the normal rain cycle and could not have been predicted. (Aside from slowing production of briquettes, the unusual rains also curtailed food production in the area, forcing some families to buy or borrow food from neighbors and sending others into a period of relative famine.) Perhaps because of this food scarcity, local rats became less picky and started eating the finished briquettes, something that had not occurred at first. Solutions were needed for all of these surprises.

A long building constructed of sustainable pine was erected. This not only allowed the women to work inside out of the rain, it also provided more space to dry wet bricks and store materials and finished briquettes on elevated shelving. Still, the building filled up quickly and a better method for drying the briquettes was needed.

Quickly reacting to the latest "bump" in the road, the KECI built its first solar tent (see photo at right, below) under the guidance of the project's first foreign volunteer. Bricks could now remain outside to dry under the sun when it was available (even on days when no staff were working), and still remain protected from rain when it did inevitably fall. An added benefit of the tent is that moving the bricks less frequently meant that far fewer broke during the drying process. (This had been an issue when briquettes were too wet from lack of sun and were constantly being moved inside and out.) A second solar tent was erected and both were quickly filled. The KECI is currently building a third, larger and more permanent tent. After drying in these tents for a few

days, the briquettes are placed on drying racks (below, left) for an additional 2-3 days where they can dry fully.

With the drying and storage issues solved, it became clear that the main bottleneck for briquette production was the process by which various types of farm waste were turned into small enough pieces to incorporate in briquettes. The method used up to this point was the local mortar and pestle, typically used for grinding peanuts and cassava. While this works quite well for some ingredients, it is very slow and tedious for others. Attaching a meat grinder to a bicycle (pictured below) made the process easier for some items, but was still rather slow. In December, a business in nearby Fort Portal was identified as having equipment capable of grinding peanut shells and avocado pits, the two most stubborn ingredients. The project is currently paying per bag of material ground in the machine, but the cost is low enough to make it worthwhile. Purchasing a similar piece of equipment is being investigated for 2012.

5. Identifying a Pilot Group for the First Trade

While fine tuning the recipe and sorting out all the unforeseen issues that arose, we purposefully did not promote the KECI within the community. Project success depends on having a quality product,

and until that was available we did not advertise the work. However, from the beginning there were interested parties who would stop by to see the work being done. This still happens, as the KECI headquarters (KHQ) is in the local trading center and much of the work is outdoors.

Having accomplished the steps detailed above we identified a group of women we thought ideal for the pilot phase. The Kibale Fuel Wood Project (KFWP) conducts annual conservation competitions. There are many aspects to these, but the key connection to the KECI is the cooking competition. Cooks who have a fuel-efficient stove can enter the bean cook off! The winner is judged not only on the taste of the beans but also on how little wood they used to prepare them. The fact that there are already cooks who are interested and skilled in efficient cooking made selecting the initial partners for the KECI much easier.

In late 2011, cooks who had entered that year's competition in Kiko Parish (the KFWP's first target area) were invited to become KECI's first trading partners. Seven women attended a workshop at KHQ where they were introduced to the bricks, partook in a question answer session, walked through the process of manufacturing kuchumbricks, watched food being cooked with bricks (and enjoyed the food), and after lunch took on the task of preparing tea with kuchumbricks by themselves for the very first time! The trading scheme was also detailed to each participant: Their first batch of kuchumbricks would be free, but any subsequent briquettes would need to be traded for with raw materials. For every ten kilograms of raw materials, the cooks will receive 25 kuchumbricks – enough to cook for one day for a large family or several days for a smaller family.

In January of 2012, project manager Margaret Kemigisa made an appointment at the home of each of the trading partners to help make a proper kuchumbrick stove. A week later, after the stove was dry, Margaret returned to observe and assist as they prepared their first home-cooked meal with kuchumbricks. Each cook was successful in cooking on her own, and used far fewer bricks than we were expecting for their first solo attempt (see table below). Since then each has come to the KHQ with raw materials and the trading scheme has begun in earnest with this group of partners.

Table 2: Average Kuchumbrick Usage by First-Time Cooks (n=7)

Food Type	Number of Bricks Used	Weight of food	Number of people fed
Rice	8	1 kg	15
Matooke*	4	2 kgs	4
Katogo**	13.5	5.5 kgs	7.5

*Matooke is a type of banana, a local staple starch common in many meals.
**Katogo is the mix of beans and matooke or another starch, also a common staple in the diet.

6. Introducing the Concept to the General Public

On December 18, 2011, at the KFWP conservation competition in Kiko Parish, the KECI was officially introduced the village members who have been active participants in the KFWP since its inception in 2006. The KECI placed a stove cooking beans with kuchumbricks on display for all to come and witness. The kuchumbricks burnt beautifully, producing the fire that people like to see but also charring nicely and burning for a very long time. Several different recipes of brick were available for people to examine and come to understand the project better. Many were intrigued by the notion of using no wood at all for cooking and seemed very excited to see what would happen next (see photos on next page). A formal introduction was made to the crowd of about 400 people.

Monitoring

As planned, a partnership has been created with scientists from McGill University's Kibale Fish and Monkey Project to conduct research concerning the amount of wood being illegally removed from the park. Project funds are helping pay for field assistants and transport to the various study sites. No results are available yet, but areas being investigated include: Kyanyawara (site of KECI's pilot work); Ibura (where we plan to open the next production center in late 2012); areas of Kibale bordering the Kiko Tea Estate; and, Isunga and Nabweya (where we hope to begin briquette production in 2013). This research will compliment the yearly surveys already being conducted by the KFWP that determine the type of stove and amount of wood used by families in the target areas by detailing the actual amount of wood coming from chimpanzee habitat. Continuing the work over several years should help determine if the KECI is having an impact on illegal wood collection.

Challenges

From the narration above you can see we have hit a few hurdles along the way, but aside from the weather the KECI team has been able to conquer the problems as they arise.

Now that production is increasing to supply the cooking partners, a new challenge the KECI is addressing is the availability of materials. Some items have proven quite easy to gather, like peanut shells, avocado pits, sawdust and dung. However, there has been difficulty finding enough paper and castor oil seeds. The castor seeds are the ingredient that helps to produce a flame from the briquettes, while paper is needed in the mixture to help hold the briquettes together. The KECI was initially able to gather seeds from local trees, but if the project hopes to provide a large quantity of bricks to the community in the future, many more seeds will be required. To address this, each member of the staff has planted castor (an indigenous tree) at her home. To address the paper shortage, project directors spoke with the Director of the Makerere University Biological Field Station (in Kibale National Park), Dr. Jeremiah Lwanga, and have secured permission to collect any waste paper the administration produces and to make requests from researchers living in the park. Additionally, the local tea factory has agreed to allow us to take their waste paper weekly, which should satisfy the project's paper needs. The KECI is also in discussions with an office supply store in Fort Portal to receive their waste paper.

Expansion in 2012

While the stated goal for 2012 is to open an additional production center and have a total of 40 families participating in the trading scheme, we are hopeful that the KECI will be able to go far above and beyond this objective. We are currently in discussions with the Kiko Tea Factory (mentioned above as a supplier of waste paper) to address their fuel needs. Kiko Tea, like most of

the region's tea estates, is located on the borders of Kibale National Park. Developing a partnership could be a crucial step towards protecting chimpanzee habitat.

The factory has its own eucalyptus plantations to provide fuel for drying tea leaves, but is severely lacking in fuel for the factory workers to cook with. This has become such an issue that the factory currently employs security guards to protect their eucalyptus, and the manager admits that some of their workers are probably collecting wood within Kibale. With nearly 600 employees, this adds up to an immense amount of destruction occurring in chimpanzee habitat. Because of the large amount of sawdust produced daily, the factory has attempted to create its own solution in the past (designing various sawdust burning stoves) without much success. The raw sawdust is simply too different from charcoal and firewood to gain support from the local population.

Kiko Tea heard about the KECI after reading in the local newspaper that our project manager Margaret Kemigisa received an award for her community work. After visiting KHQ, the estate manager became very excited; Kiko Tea had just recently become certified by the Rainforest Alliance. Finding a good use for the sawdust, he surmised, would help with re-certification and please the owners. Inspired by this conservation-minded businessman, the KECI is currently investigating various combinations of paper, saw dust, and corn flour (all readily available at the factory) to develop a special recipe for Kiko Tea. At that point, the KECI team will help the factory construct presses and solar tents where their own staff will produce the thousands of briquettes needed. Hopefully, by June of 2012 this expansion will be put in place. If successful, the factory manager suggested that there are many other tea factories that would relish similar assistance.

Budget Justification

As you'll see on the next page, the KECI fell under budget for 2011. This is partially due to the highest exchange rate we have ever encountered in Uganda. When planning for the financial needs of the KECI we used a lower exchange rate to ensure that funds would be safe through fluctuation of rates. Luckily, we watched the rate carefully and transferred funds at an exceptional time.

Additionally, the budget was reduced because no additional grants were received. Because of this, all international travel expenses were provided by the 2011 KFWP budget, effectively lowering the KECI's budget by $4,160. For 2012, the KECI has already received one grant to compliment the Arcus Great Apes Fund grant and has a second grant currently pending.

Thank You!

Thank you all so very much. Without the generosity of the Arcus Great Apes Fund, the KECI may never have come to fruition. The foresight of the Arcus Foundation, realizing that effective ape conservation cannot occur without addressing the needs of local communities living alongside our wild cousins, is to be commended. Thanks also to Idea Wild for the in-kind donation of grinding equipment for briquette production.

July – December 2011 Kibale Eco-Char Initiative Budget

	Total Budgeted Year 1	Total Spent
EXPENSES		
Category	Amount	Amount
Staff		
Eco briquette team	$3,900	$2,400.00
Project Manager	$336	$336.00
Project Directors	$3,000	$3,000.00
Volunteer (International)	$1,542	$1,542.00
Monitoring Staff	$1,000	$1,000.00
Staff Total	$9,778	$8,278.00
Direct Program Costs		
Printing and Postage	$255	$225.00
Meeting Expenses	$255	$225.00
Supplies	$1,038	$1,038.00
Travel: International	$4,160	
Travel: In-situ	$1,806	$1,176.00
Rent for storage facility	$75	$75.00
Capacity Building	$600	$414.00
In-situ living expenses	$1,014	$436.39
Direct Program Total	$9,203	$3,589.39
TOTAL EXPENSES	$18,981	$11,867.39