



# ECOLIFE

PEOPLE & NATURE  
AN INTERCONNECTED HEALTH

**CASE FOR SUPPORT /  
PROSPECTUS**

**FOR**

**THE UGANDA CONSERVATION &  
COMMUNITY HEALTH PROJECT**

---

# UGANDA CONSERVATION & COMMUNITY HEALTH PROJECT

## *Improving Lives & Human Health, Protecting Mountain Gorillas & Other Endangered Wildlife, Sustaining the Bwindi Forests*

Imagine a world where all people recognize their interdependence with our natural environment. A world in which humans and wildlife thrive in a dynamic balance. A world where ecological sustainability has been achieved and we've transitioned to a planet of true environmental richness. A world that is conducive to and protective of all life.

ECOLIFE holds this grand vision and is working hard to bridge the often disparate worlds of conservation (protecting wildlife and natural resources) and community-based development (improving the lives of our human family) – bringing them together to develop this harmonious and thriving coexistence.

### Summary of the Uganda Project



ECOLIFE's newly launched Uganda Conservation & Community Health Project (UCCHP) is designed to help build this bridge in the indigenous communities of Bwindi & Buhoma, located just outside the Bwindi Impenetrable Forest – where almost half of the world's magnificent but critically endangered mountain gorillas live.

ECOLIFE will install approximately 400 safe, fuel-efficient stoves in homes of the impoverished people living in these two communities – all of whom are still cooking over open fires inside their homes. The stoves will have chimneys to vent toxic smoke outside, greatly increasing the families' respiratory and overall health – especially for the women and children who spend hours cooking inside smoke-filled homes. At the same time, the stoves greatly reduce the incidence of horrific burns suffered by children because of open fires.

Deforestation and loss of habitat threatens the very survival of the mountain gorillas and other diverse wildlife living in the Bwindi Impenetrable Forest. These fuel-efficient stoves use 60% less wood, which significantly reduces the unregulated harvest of trees. Here in Bwindi, the lives of the people, the forests and the gorillas are inextricably linked. A deterioration of one will have dire consequences on the health and well-being of the others.

Fulfilling ECOLIFE's vision of healthy communities in harmony with their environment is what brings the organization to Uganda to create this prototype project and implement practical, sustainable solutions to some of the world's biggest conservation issues.

### **Bill Toone – ECOLIFE's Visionary Leader & Global Conservationist**

Executive Director Bill Toone, ECOLIFE's founding trustee and lifelong conservation biologist, has been an inspirational spokesperson for endangered wildlife for over 30 years. Starting in the early phases of the California condor recovery program, Bill Toone played a key role in the development of endangered species recovery strategies for what was North America's most endangered bird.

Later, as director of applied conservation programs for the Zoological Society of San Diego, his work carried him through a variety of conservation efforts throughout the world. Bill's work includes extended stays and multi-year programs in a diverse range of nearly 40 countries. He has worked with the California condor in the USA, the giant peccary in Paraguay, old growth forest studies in Papua New Guinea, the St. Lucian



Iguana in St Lucia, the giant armadillo in Argentina, and national park development in Madagascar.

During his conservation career, Bill has collaborated with or been contracted by a large variety of organizations including: Zoological Society of San Diego, U.S. Department of Defense, U.S. Department of Fish & Wildlife Service, Papua New Guinea Ministry of the Environment, The Nature Conservancy, World Wildlife Fund, C.A.R.E. International, Wildlife Conservation Society, USAID, Tortuguero National Park, XERCES, St. Lucia National Trust, Durrell Wildlife Conservation Trust, CITES/Paraguay, California Department of Fish and Game (now the California Department of Fish and Wildlife), SINAC (Sistema Nacional de Areas de Conservacion) in Costa Rica and many others.

This exposure to very different habitats, peoples and their cultures, and a variety of political systems greatly shaped Bill's conservation views. For example, Bill came to realize that all people – whether a land developer in the USA or a Toba community member in Argentina – share a deep desire to care for and protect their loved ones. Unfortunately, the Toba will shoot the last giant armadillo or the developer will plow the last bit of habitat ... if they feel this is what they need to do to feed their families. They don't want to be destructive but usually feel they have no other choice.

### **A Significant & Necessary Shift in Conservation Thinking**

Bill came to recognize that the failure of many well-intended conservation programs was caused by a general disregard of the human element. Regardless of where he was working, the story of each endangered species began to sound the same — the species were declining in numbers due to “loss of habitat.” In almost every case, that loss was associated with a human demand for shared resources. It seemed that conservation programs were pitting the needs of wildlife against the needs of people.



Whether produced by natural disaster or human influence, conservation challenges always involve issues of cause and effect. Human “cause” is often simply the case of human “need” – the need for natural resources like food, water, soil, wood, and land space. These are examples of resources people compete against wildlife to use, own and exploit. When fighting for these resources, humans usually win and wildlife loses. But these are only battles – not the larger war – that we are fighting. And it is we humans – through a decline in our quality of life – that will ultimately pay the price as we deplete our planet's life-sustaining natural resources, ecosystems and biodiversity.



“Sustainability is the ability of the current generation to meet its needs, without compromising the ability of future generations to meet theirs.” – United Nations, 1987.

The answer to this unsustainable competition between man, wildlife and nature is to develop a new means of accommodation – tools and techniques that allow us to reduce the conflict and use and *sustain* the resources that we all need. Not to create projects that serve one to the detriment of the others. Not the condemnation of traditional homelands, or the wholesale prohibition of sustenance farming or hunting, nor the demolition of dams or roads or mines.

Instead, ECOLIFE believes the real answer is to create projects that study and address the needs of all living things occupying a challenged area, and then develop true workable solutions in partnership with the local communities.

It's critical to find better, less destructive ways for people to meet their needs and provide for their families, while preserving the natural environment all around them.



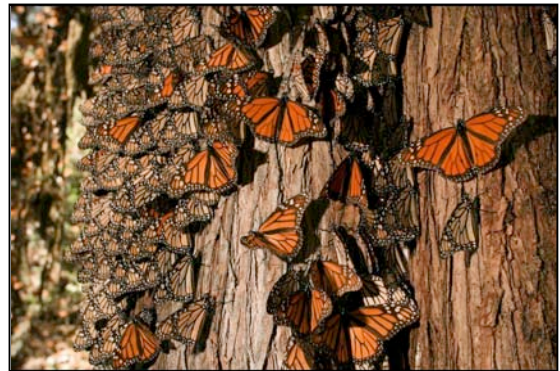
## The Founding of ECOLIFE



A turning point in Bill's evolution as a conservationist began on April 4, 2000 when Cyclone Hudah struck Madagascar, an island country off the southeastern coast of Africa, in which he had worked for many years. Cyclone Hudah, combined with deforestation and poor agricultural practices, resulted in the deaths of many people—some of them Bill's local colleagues and more importantly, friends and families with whom he had worked and developed close personal relationships. The conservation organizations supporting Bill's work backed away in the face of this human crisis. People were not – and still are not – the focus of conservation programs. This seemingly callous reaction galvanized Bill and some of his colleagues to take action to help the people of this remote community in Madagascar recover from the cyclone.

Just two years later, in January of 2002, a cold storm swept through the region of Mexico where most of the North American population of the monarch butterfly over-winters. As a result of ongoing deforestation of the Oyamel fir forests, hundreds of millions of monarch butterflies – more than one-third of the entire North American population - froze to death that day. Deforestation had resulted, in part, from people living around the butterfly sanctuaries cutting down trees for firewood to cook and stay warm. Sadly, the use of indoor cooking fires was also causing significant negative health impacts for the local people.

These two unrelated tragedies – a loss of human life in Madagascar and the death of literally millions of monarch butterflies in Mexico – forever changed how Bill would look at conservation and became the impetus for creating ECOLIFE. In 2003, ECOLIFE was established by Bill Toone and like-minded colleagues to shift the thinking and begin to create necessary action by using conservation as a tool—not only to protect the remarkable natural world but also to measurably improve human life on our planet.



### ECOLIFE's Global Programs

Because loss of habitat is the single largest cause of species extinction in the world, ECOLIFE is committed to addressing the root causes of habitat loss while helping people to improve their health and well-being and live in greater harmony with their environment. Each of ECOLIFE's programs intimately links a community of people (often marginalized and culturally endangered) and their interaction with a threatened species or endangered biological resource.

#### ECOLIFE has programs in the following four countries:

- **USA** – Southern California (Sustainable agriculture - aquaponics)
- **Mexico** – Michoacán (Purechepan & Mazahua communities / monarch butterflies)
- **Uganda** – Bwindi (Batwa & Bakiga peoples / mountain gorillas)
- **Kenya** – Samburu (Samburu people / elephants)

ECOLIFE's innovative approach to conservation and humanitarian work is holistic. Our projects work to bring immediate and measurable health and other benefits to the communities where we work. It is not enough to help individuals become wildlife guides or guards – conservation work must touch every member of a community in a positive way. The engagement and participation of the entire community in working toward mutually beneficial goals are critical factors in ensuring project success.

## **Catastrophic Levels of Species Extinction / Value of Biodiversity**

Although the following news has been broadly disseminated, it still hasn't reached the necessary level of awareness in the general public. We are in the midst of a mass extinction crisis – half the species of life on Earth are in danger of becoming extinct in 50 years! This is the sixth great extinction documented on Earth. A 2008 study in the *Proceedings of the National Academies of Science* said the current extinction period may be the greatest event in the Earth's history and the first due to human actions. It is a result of habitat destruction, pollution, invasive species, and climate change.

Although species extinction is a natural phenomenon, its “background” rate is about one to five species per year. Scientific data shows current losses well above this background rate. According to biologist E.O. Wilson, we are experiencing this catastrophic extinction “at 100 times the normal rate of extinctions and this rate is expected to rise to 1,000 or higher.” But, even more importantly, most of us are not aware as to how this loss of biodiversity might personally affect us.



### **Habitat Loss**

Habitat alteration and loss is the main force driving species extinction. As human populations increase exponentially, more land is deforested or otherwise altered for housing, farming, livestock, fuel, roads, and other uses. Species previously living on that land either adapt to the change or, more commonly die. Worldwide, deforestation is occurring at record rates. Efforts to reestablish habitat seldom work and are less stable than the natural systems that evolve over time.

### **Climate Change / Global Warming**

The warming climate is undermining biodiversity by accelerating habitat loss, altering the timing of animal migrations and plant flowerings, and forcing some species toward the poles and to higher altitudes. Major alterations to the complex and delicately balanced food chain will have significant and often unpredictable impacts, including the domino effect. Many species such as polar bears and penguins are already suffering and severely threatened by the effects of climate change.

### **Why Biodiversity / Species Extinction Matters**

Biologists are often asked to explain why a certain species, like the condor or a polar bear, is important to save. Too often, biologists try to answer directly – saying a condor may hold a secret to disease treatment in humans or the mosquito supports a system that benefits more people than it hurts. But trying to answer this question on a species by species basis is a pointless exercise.

Instead, we need to back up and look at the big picture – the pyramid of life – before the networks of interdependence begin to make sense. Think of the mighty Egyptian Pyramids. Even today we wonder how they were put together and marvel at their “magic.” It is unlikely that you would rub your hands on the pyramid and then ask someone to tell you the specific value of the dust on your hands. The pyramids, as a whole, speak for themselves – and so it should be for the complex network of life, which we are much further from truly understanding than we are about the construction of the pyramids.

Species loss weakens the intricate web of biodiversity – the diversity of life that sustains both ecosystems and human cultures. Our ecosystems and life are in a delicate balance and things that are undone in ignorance will take many lifetimes to reach balance again.





## THE UGANDA PROJECT

### **Bwindi Impenetrable Forest / Uganda's Endangered Mountain Gorillas**



Bwindi Impenetrable National Park, a UNESCO-designated World Heritage Site, is located in southwestern Uganda, along the border with the Democratic Republic of Congo. The Park, which is part of the Bwindi Impenetrable Forest (BIF), is comprised of 128 square miles of jungle forests. Ecotourism is the only activity that is allowed in the BIF and it is accessible only on foot.

The Bwindi Impenetrable Forest is one of the richest ecosystems in Africa and features an incredible diversity of species. The park provides habitat for some 120 species of mammals, 348 species of birds, 220 species of butterflies, 27 species of frogs, chameleons, geckos: many many of these species are endangered. The park is a sanctuary for colobus monkeys and chimpanzees.

However, the Bwindi Impenetrable Forest is best known for the 400 Bwindi gorillas which live in the forest – almost half of the world's population of the critically endangered mountain gorillas. American naturalist Dian Fossey brought international attention to these remarkable primates, as portrayed in the 1988 film “Gorillas in the Mist.”

The research by Dian Fossey of gorillas in their natural environment – and that of Jane Goodall studying chimpanzees – sparked a huge wave of interest and support for these charismatic primates. The Bwindi Impenetrable National Park became a popular tourist destination with the start of gorilla tracking in 1993. Currently, there are five habituated mountain gorilla groups open to eco-tourism in Bwindi and some 10,000 people come to Uganda each year to visit them.

People are inextricably drawn to these magnificent animals - our biological “cousins”- with whom we share about 98 percent of our DNA. The following quote from a Gorilla Tracking Uganda client captures the feeling:

*There are few wildlife experiences that can compare to tracking a family of mountain gorillas through the thick, tropical rainforests of Uganda. George Schaller famously stated that "No one who looks into a gorilla's eyes – intelligent, gentle, vulnerable – can remain unchanged, for the gap between ape and human vanishes, we know that the gorilla still lives within us".*



### **Uganda & Bwindi's Potential for Bird-Related Ecotourism**



Uganda is regarded as Africa's best destination for bird watchers (or ‘birders’) and other nature enthusiasts. The country boasts of over 1,058 bird species, which is 11% of the globe's total, and 50% of Africa's. This diversity is attributed to its various habitats, which include arid, semi-desert, savannahs, lowland and montane rainforests, wetlands, volcanoes and an Afro-alpine zone. The African Bird Club ranks Uganda as home to two of the top 10 birding sites on the continent – with Bwindi Impenetrable Forest National Park among them. (pictured- the gray crown crested crane – Uganda's national bird)

With about 10 million birders moving around the world annually, many regions are now recognizing the economic potential of bird-related tourism. There is also a growing trend among bird tour operators to practice sustainable and socially responsible ecotourism, while relying on local goods and services or supporting local conservation projects.

Despite such high rankings and the diversity of bird species, Uganda continues to attract a paltry number of birders. However, many officials believe that bird-related sustainable tourism has the potential to turn around Uganda's tourism sector and provide a much needed source of livelihoods for communities like Bwindi. Both gorillas and birds attract high-end travelers. However, unlike gorillas, there are no limitations on the number of tourists that can visit the country's birds.



In general, tourism is a vital component of many national economies. If enough travelers pay to visit botanically interesting and/or wildlife-rich areas, this is a strong incentive for local communities to value and protect habitat. Obviously, the local people must be direct economic beneficiaries of tourism to be inspired to maintain natural resources for long-term motives rather than short-term gain.

### The Communities & People of Bwindi and Buhoma



ECOLIFE will be working in the impoverished communities of Bwindi and Buhoma, which are mainly populated with the Bakiga and Batwa peoples. These communities abut directly up to the Bwindi Impenetrable Forest with absolutely NO buffer zone between humans and the gorillas. People and livestock wander into the forest in search of resources like fuel wood, food and medicine while gorilla families are known to raid crops near the edge of the forest. Unfortunately, gorillas (with their close genetic makeup to humans) are prone to many of our same diseases and vice-versa.

The Batwa, a pygmy people, are an indigenous group of hunter-gatherers whose traditional land is within the

boundaries of the Bwindi Impenetrable Forest. They were formally evicted from these territories in 1992 when Bwindi Impenetrable National Park (BINP) was designated a national park, which was done to protect the remaining population of mountain gorillas. The Batwa were no longer permitted to enter the park or access its resources. In fact, they can be arrested for illegally crossing into the forests.

For thousands of years, the Bwindi forest had been the Batwa pygmies' home. As the original dwellers of this ancient jungle, the Batwa were known as "The Keepers of the Forest." They lived in harmony with the forest and its creatures, including the mountain gorillas. Some anthropologists estimate that pygmy tribes such as the Batwa have existed in the equatorial forests of Africa for 60,000 years or more.

The lives of the Batwa pygmies changed forever with their eviction from the park. Since they had no title to land, they were given no compensation. The Batwa became "conservation refugees" in an unfamiliar, unforested world. Many Batwa died during the early years of exile, and the tribe's very existence was severely threatened.







Today, as landless peasants, the Batwa are some of the most severely marginalized people in the world. Only an estimated 4,000 Batwa live in southwest Uganda, about 1,000 of them in the district which includes Bwindi. Sadly, the average life expectancy of the Batwa is less than 30 years. Many of them now squat near the perimeter of the parks in very primitive conditions, eking out a living from illegal hunting and honey gathering, and selling their labor to farming communities.

Since 2001, American medical missionaries Dr. Scott and Carol Kellermann have dedicated themselves to improving the health and living conditions for the Batwa, including the building of homes, a hospital and clinics. ECOLIFE will be partnering with the Kellermann Foundation in Uganda.

### **Environmental Impacts of Indoor Cooking Fires**

It is estimated that nearly three billion people around the world cook indoors on an open fire or via rudimentary, traditional cookstoves burning wood or charcoal (or other fuels like animal dung, crop waste and coal.) That means that more than 40% of the world's population still depends on solid fuels for cooking their food and heating their homes.

The resulting environmental impact of the smoke is staggering. In addition, the collection of firewood is a significant contributor to habitat destruction – habitat that is critically necessary to the survival of endangered species like the mountain gorilla. In turn, deforestation leads to loss of watersheds and clean drinking water that are vital to maintaining healthy human populations.

### **Deforestation & Watershed Loss**

According to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, the overwhelming direct cause of deforestation is agriculture. Around the world, they estimate subsistence farming is responsible for 48% of deforestation and commercial agriculture for 32%. Logging is responsible for 14% and fuel wood removals make up 5% of deforestation. Other organization's report numbers may vary, but without question the harvest of fuel wood is a significant and, in most cases, unsustainable impact on the environment.

Forests hold soil in place and act as a sponge to hold water during times of limited rainfall. When areas are deforested, soil erosion, mudslides, landslides and flooding can occur and the ability to store water is lost. This depletion of watersheds destroys not only the forests but also our fisheries and water reserves.

In addition, when forests are cut down, the amount and quality of the water are changed because trees and plants provide a natural filter to clean the water. Without forests, water washes down/out and pulls dirt, minerals, toxins, fertilizers and more with it, leading to unclean water and the changing of the watershed's ecosystem.

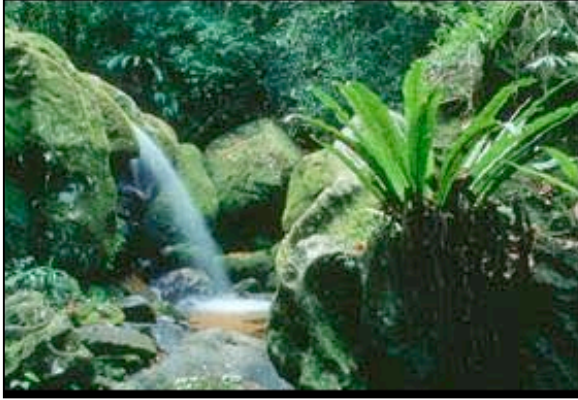


Uganda has lost nearly 80% of its forest since the 1960's. This has had a profound impact on the people and wildlife that depend on the forests for their survival. Unproductive rural agriculture and fuel wood harvesting are the two main issues currently affecting the forests around Bwindi and Buhoma.



## Value of Forests

Home to countless creatures, forests are the lungs of the Earth, arbiters of weather patterns, major storehouses of carbon, and our original cathedrals. Forests have long been valued and exploited for timber products, leading to the loss of the great majority of global primary forest ecosystems. In fact, 70% of the world's original forests have been eliminated.



Scientists now agree that the world's rainforests are the best natural defense against climate change because they are "carbon sinks." For example, Indonesian old-growth rainforests store almost 750 tons of carbon dioxide—the equivalent of 620 flights between New York and London—per acre.

As a result, trees are starting to be looked at differently because of this ability to suck carbon out of the atmosphere and sequester it in their biomass. Unfortunately, when cleared (for timber, agriculture, or fuel), much of that stored carbon is released back into the atmosphere, furthering global warming rather than curbing it.

## Climate Change / Black Carbon

On a global scale, these inefficient traditional cook fires are a significant contributor in the release of carbon dioxide (CO<sub>2</sub>) and other heat-trapping greenhouse gases (like methane) into the atmosphere, contributing to climate change.

When the amount of greenhouse gases released into the atmosphere exceeds the capacity of the ocean, forests and soil to absorb it (acting as "carbon sinks"), more heat is retained in the atmosphere. As a result, the air, ocean and land temperatures rise and global warming is said to occur. Climate change is a result.

Black carbon results from the incomplete combustion of carbon-containing fuels – fossil fuels, biofuel and biomass (like fuel wood and charcoal). Black carbon, which is emitted in soot, stays in the atmosphere for only several days to weeks, whereas carbon dioxide has an atmospheric lifetime of more than 100 years.

Burning solid biomass is inefficient at converting energy to heat for cooking, and releases a toxic mix of health-damaging pollutants that contribute to climate change at regional and global levels. In particular, some of these pollutants, such as black carbon and methane, have short life spans but significant consequences for the climate.



Black carbon is estimated to contribute the equivalent of 25 to 50 percent of carbon dioxide warming globally. Methane emissions are the second largest cause of climate change after carbon dioxide. Clearly, inefficient household energy use (via these traditional cookstoves) has adverse consequences for the environment, air quality and human health. Addressing the black carbon component of climate change through improved rural cookstoves is the most inexpensive and effective short-term step that can be taken to address the global greenhouse effect.

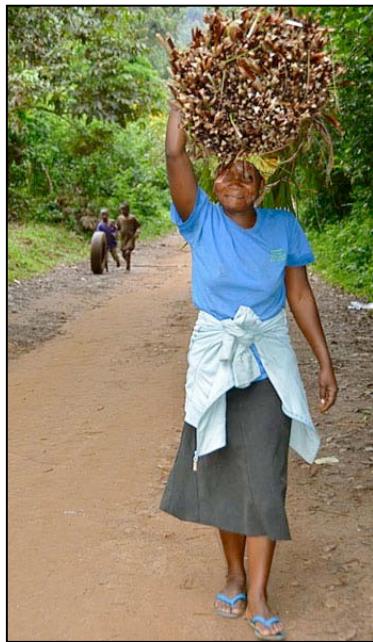
## Human Health & Safety Impacts of Indoor Cooking Fires

### Health Impacts

The serious impact of these indoor fires is not just limited to the environment. For people, the results of breathing cooking smoke during long days of preparing meals is the equivalent of smoking five (5) packs of cigarettes daily! It's no wonder that the World Health Organization (WHO) recently announced that exposure to smoke from cooking fires is the largest environmental killer of people.

Plus, the just released "Global Burden of Disease 2010" report concluded that **household air pollution from cooking with solid fuels kills 4 million people annually worldwide**. This stunning figure includes 3.5 million deaths associated with indoor smoke exposures and another 500,000 deaths from the contribution of cookstoves to outdoor air pollution. (see *Global Burden section below*)

Sadly, millions of people die prematurely each year from illness related to the smoke exposure – more than eight deaths every minute of every day. In addition, nearly 50% of pneumonia deaths among children under age five are due to particulate matter inhaled from indoor air pollution.



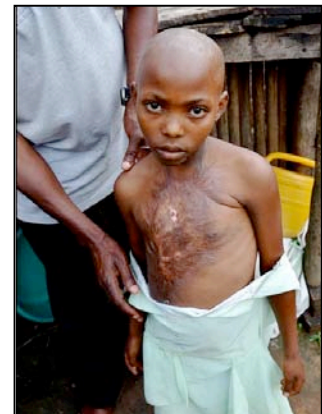
Reliance on inefficient cookstoves and fuels leads to serious health impacts (emphysema, heart disease, cancer, cataracts, etc.) and economic burdens that disproportionately impact women and girls, particularly because cooking and fuel collection largely remain a woman's responsibility. Frequent exposure to cookstove smoke can cause cataracts, and is the leading cause of blindness in developing countries.

Exposure to smoke is greatest among women and young children, who spend the most time near open fires or traditional cookstoves tending to the family meal, or schoolchildren who may study by the light of an open flame. All inhale unhealthy levels of emissions. These rudimentary wood-fired cookstoves and open fires emit fine particles, carbon monoxide, and other pollutants at levels up to 100 times higher than the recommended limits set by WHO.

### Safety Issues

In addition to the damaging effects of smoke exposure, there is another tragic consequence for the countless families who must cook meals with open fires and unsafe cookstoves. Children (especially the little ones) frequently suffer terrible burns during the cooking process or during the night when they accidentally walk or fall onto hot coals or embers that have not yet been extinguished.

Burns from these unsafe cooking conditions contribute to a substantial percentage of the estimated 300,000 burn deaths that occur annually. Because burns require prompt and sophisticated medical intervention often lacking in remote areas of the world, such injuries often result in debilitating scarring and loss of movement in their victims.



## Global Burden of Disease 2010 Study

The recently released "Global Burden of Disease 2010," a new systematic analysis of all major global health risks, has concluded that household air pollution from cooking with solid fuels kills 4 million people annually worldwide. This figure is double the previous estimate, and includes 3.5 million deaths associated with indoor exposures and another 500,000 deaths from cookstoves' contribution to outdoor air pollution. Additionally, millions more are sickened from lung cancer and disease, lower respiratory infections (pneumonia), cardiovascular disease, and cataracts associated with household air pollution.

The Global Burden of Disease Study 2010 (GBD 2010), published on December 13, 2012 in the journal *Lancet*, is the largest ever systematic effort to describe the global distribution and causes of a wide array of major diseases, injuries, and health risk factors. The new integrated exposure-response (IER) analyses provide excellent new cross-risk-factor validation of the effects found for a range of diseases. IERs link epidemiological evidence across the four particle categories - household air pollution (HAP), outdoor air pollution (OAP), active smoking and secondhand tobacco smoke.



Dr. Kirk Smith of the University of California-Berkeley, chair of the skilled and dedicated expert group on Household Air Pollution (HAP), summarized key aspects of the assessment related to HAP:

### The scale of HAP's health impact is quite large:

- 3.5 million direct premature deaths annually in 2010 – compared to 3.3 million for outdoor air pollution (particles and ozone) and 6.3 million for active and passive smoking.
- 0.5 million more deaths from outdoor air pollution (OAP) due to household fuels — what one might call "secondhand cookfire smoke."
- This makes ~4 million total deaths annually attributable to HAP from cooking fuel.
- 0.5 million (500,000) of the total are child pneumonia deaths.
- The rest (3.5 million) are adult deaths (men and women) from lung cancer, cardiovascular disease (CVD), and COPD. (*Cataracts are also included, but they cause very few deaths.*)
- In terms of absolute impacts, men are more affected than women. This counterintuitive result is because men have so much higher background rates of the major diseases. Thus, although women have higher exposures and higher elevations in risk for these diseases, men end up with the larger burden. In relative terms, as indicated below, however, women are more affected by HAP.
- In terms of DALYs (disability-adjusted life year), HAP is the 2nd most important risk factor for women and girls globally *among those examined\** and 5th for men and boys. HAP is 1st for women and girls in most of sub-Saharan Africa and for both sexes in South Asia. (\*risk factors like malaria, HIV, child vaccinatable disease or road traffic accidents which are huge health burdens were not examined).
- HAP is the most important single environmental risk factor globally and in poor regions behind outdoor air pollution (OAP) in richer countries, of course, and in China, where OAP ranks fourth among all risk factors examined.
- 2.8 billion people rely on solid fuels for their main cooking fuel in 2010, a number that seems to have been roughly stable globally for the last decade or so. There are now more people than anytime in human history relying on solid fuels for cooking.

### Additional Information

- This study allows the HAP results to reflect the full benefit that could be expected from moving the 40% of households with solid fuel to the low pollution experienced by 60% of world population using gas or electricity for cooking.



- HAP plays a large role in non-communicable diseases (NCDs), which are now understood to be so important in India and other low and mid-income countries.

### Devastating Effects of Cook Fires in Bwindi & Buhoma – A Personal Account

A 2011 survey conducted by ECOLIFE of 150 families in the Buhoma and Bwindi communities gives testimony to the serious consequences of these cooking fires. The survey indicated that 72% of the people suffer from respiratory ailments and 65% have suffered from serious burns associated with open fires.



ECOLIFE’s Alexis Chavis was part of the advance team helping with the surveys. She writes: “During my time in Uganda, I spoke with over 100 people in the Bwindi & Buhoma communities. I learned about their lives, heard their stories, and listened to their challenges. One of the families’ biggest hardships is caused by the antiquated, dangerous and resource-exhausting “3-stone stoves.”

These “stoves” (which are essentially open cooking fires) burn an incredibly large amount of wood, which must either be collected or paid for. Many of the families cannot afford to purchase firewood, so they try to collect it themselves. It can

take up to 3 hours to collect one bundle of wood. Unfortunately, the families still do not have enough wood to boil all their drinking water, which is often collected from contaminated local streams. The people have told me about their constant battles with waterborne disease and belly aches from drinking this dirty, untreated water.

However, the most horrific effects from these stoves are the burns. I have seen many children covered with scars – some healed, some fresh – from accidentally knocking a pot off the stove while playing. I’ll always remember one boy I met who had his mother’s hand print seared onto his stomach. The mark was left when she grabbed him from the puddle of spilled boiling water and ran him to the local clinic. These burns, with their lifelong scars, are present in over 60% of families in Bwindi. It’s tragic and utterly avoidable with today’s stove technology.”



### ECOLIFE’s Fuel-Efficient & Safe Stoves

The Uganda Conservation & Community Health Project will be installing a modified version of the Patsari stove (a type of “rocket” stove) into homes in Bwindi & Buhoma. These stoves have a demonstrated 60% increase in fuel efficiency over a traditional open fire. This translates to **60% less wood needed for fuel and therefore 60% fewer trees are cut down.**

Equally important, it allows family members (usually the women and children) to spend much less time collecting firewood, thereby reducing their exposure to such hazards as violence, snake bites, broken bones or other physical injury.

In Uganda, the average time spent collecting firewood per family is 2 hours/day. The women can use the extra time for producing more food or income-generating activities. And, perhaps more children will be allowed to attend school when relieved of this time-intensive household duty.

Critically important to the project's success is the fact that these permanent concrete and brick Patsari stoves will be vented with chimneys carrying toxic smoke out of the home, greatly reducing the incidence of respiratory and other diseases. In addition, chimney venting prevents carbon monoxide (a silent killer!) from building up indoors.

These stoves will be built up and off the floor, with their burners located at an ideal ergonomic height for ease of cooking. In addition, the Patsari stoves are much safer for children who frequently suffer devastating burns from traditional cooking fires. The stove can't be tipped over and the hottest places are out of reach of inquisitive children. Because the stove is raised and enclosed, it also protects kids from falling into the fire.



There is also great value in these stoves serving as the centerpiece of a family kitchen. Because women spend so many hours cooking, it is important for stoves to be in a permanent location in the home. Having a dedicated kitchen space is culturally important in many places around the world. Whether in a developing country like Uganda or the industrialized world, the kitchen naturally becomes the center of home and family life.

Bill Toone first started providing fuel-efficient stoves in Mexico, where the most popular stove was the Patsari, developed by GIRA in Patzcuaro, Michoacán. These stoves were safe, efficient and relatively inexpensive. As a result,

Bill has been working successfully with Patsari stoves for over 15 years, including during his days at the Zoological Society of San Diego and now with ECOLIFE on its Mexico project for the past eight years.

### **The Global Alliance For Clean Cookstoves**

The Global Alliance for Clean Cookstoves – of which ECOLIFE is a partner – is an innovative, public-private partnership led by the United Nations Foundation. Based in D.C., its initiative is to save lives, improve livelihoods, empower women, and protect the environment through the universal adoption of clean cookstoves and fuels and by creating a thriving global market for clean and efficient household cooking solutions. <http://www.cleancookstoves.org/>



The Alliance's very ambitious but important goal is to foster the adoption of clean cookstoves and fuels in 100 million households by 2020. In September 2012, the Alliance prioritized six countries for immediate engagement during Phase I of its business plan (2012-14). These priority countries include Uganda and Kenya where ECOLIFE is working.

### **Problems with Cheaper Camp & Other Types of Stoves**

A number of alternative stoves are on the market, including various camp stoves and solar stoves. While these stoves are also fuel-efficient and low-cost, none of them (unlike those ECOLIFE uses) take into account all of the many important cultural, health, conservation and economic considerations.

### **Important Factors in Stove Selection:**

- Cultural
  - How the local people cook (i.e., type of burner / 1 or 2 burners)
  - When they cook (i.e., solar is only useful in the middle of the day)

- Permanence of the stove for creating a “family kitchen”
- Health
- Production of dangerous smoke (with the need to vent it out of the home)
- Protection of family members from burns
- Safety of collecting fire wood
- Conservation
  - Amount of wood needed
  - Availability of alternative fuels for the stoves
  - Weather factors (solar stoves are not good for rainforests or rainy areas)
- Economics
  - Time needed for collecting fire wood
  - Cost of fuel wood if purchased (as many Ugandan families do)

**Camp stoves** are portable and often placed on the floor, so they can easily be knocked over, continuing to cause significant burn risks for children. Equally problematic, they don’t have a chimney to vent the smoke – so this type of stove will remain part of the global health problem rather than part of a solution. Their fuel efficiency produces a near invisible smoke leading people to incorrectly assume that it is safe to use them indoors.

These camp stoves (using wood or charcoal) can be impractical since they have only one burner, which can prove difficult when cooking for large families. Lastly, portable stoves frequently “disappear” (through being stolen, sold or traded), thwarting an organization’s best intentions and leaving them with no effective way to evaluate the value of their work.

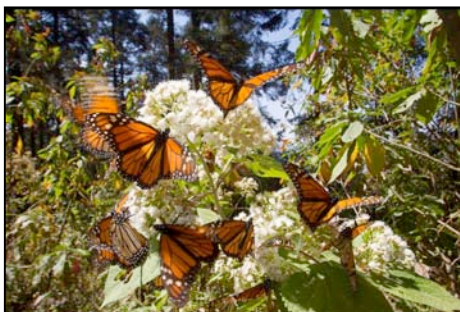
In Mexico, ECOLIFE stoves have three burners. But different cultures have different needs. Therefore, there is not a “one-stop” stove store to address this crisis. For example, we are learning that in Kenya/East Africa, the local people prefer to have only one cook top. This demonstrates the cultural variation among peoples and the importance of customizing stoves for each country and community’s needs and preferences.



Regarding **solar stoves**, two key limitations involve the timing of cooking and its cultural acceptance. Most rural communities start their day pre-dawn and finish their labor at dusk, which makes cooking breakfast and dinner with the sun very difficult. In addition, solar cooking is often not culturally appropriate or accepted by local people who prefer their traditional cooking methods.

***Bottom Line: indoor stoves must be built in a sturdy and permanent manner and have chimneys to vent smoke out of the home to truly be safe for families.***

### **ECOLIFE’s First Stove Project – Helping Protect Monarch Butterflies in Mexico**



In 1976, National Geographic revealed the location of the monarch butterflies’ over-wintering site in Mexico. Every year, hundreds of millions of monarch butterflies arrive in the ancient Oyamel fir forests of the Sierra Madres in Central Mexico, having traveled as far as 3,000 miles. The monarch butterfly has called these forests home for tens of thousands of years. Sadly, since 1976, their numbers have been trimmed by as much as 75% due to the destruction of the fir forests.



The loss of more than a quarter billion monarch butterflies in Mexico in 2002 was directly related to the degradation of their forest home. As mentioned, the combined tragedies of Madagascar and Mexico led Bill Toone to start ECOLIFE. Bill and his team chose the Mexican state of Michoacán to launch the organization's first program. There, ECOLIFE has implemented a community-based conservation project that protects monarch butterfly habitat and directly improves the quality of life for people in the communities within and surrounding Central México's Monarch Butterfly Biosphere Reserve (MBBR).

Since 2004, ECOLIFE has been building the fuel-efficient Patsari stoves and planting trees in the communities in and around the butterfly forests. One thousand (1,000) stoves have been installed so far, making a significant difference in the lives of the rural Mexican women who spend an average four hours each day cooking the family meals. These stoves have become an important part of the family home – a real centerpiece and source of pride. In addition, over 45,000 trees have been planted. Incredibly, every tree planted or conserved provides over-wintering habitat for 25,000 monarch butterflies.



### **Monitoring of Stove Utilization**

Despite the physical permanence of the Patsari stoves, ECOLIFE knows that it is important to track and monitor results. Therefore, in-person family interviews are conducted by an independent third-party reviewer every year to ascertain if the stoves are still being used and if not, why not. In addition, ECOLIFE wants to learn how useful the stoves have been in improving the quality of life of the family.

Starting in 2013, ECOLIFE intends to insert a Stove Utilization Monitor (SUM) into approximately 10-15% of the newly installed stoves in Mexico. This will allow the organization to receive actual utilization data independent of the interview data. The SUM data will be cross-matched with the personal interviews.

### **Community Engagement & Lessons Learned**

Bill likes to tell the following story about important “lessons learned” in Mexico regarding community engagement and marketing efforts. The first Patsari stoves were installed with a ceramic tile featuring a butterfly graphic (costing an extra \$10). The local people were first told that the stoves were going to help save monarch butterflies. Only after shifting the “sales message” to the fact that the stoves were going to be safer for their kids, improve their family's health, and decrease their workload did the stoves gain wide acceptance.

To save money, ECOLIFE had begun to leave off the butterfly tiles, but community members wanted the tiles put back on the stoves. In fact, as their quality of life and health improved, families began to ask important questions about the relationship between the stoves and butterflies. This experience suggests that with families safer and healthier, they were able to think about other things beyond taking care of their next meal. Now they could become a community ally in the preservation of the butterflies and their habitat.



There is a direct correlation between poverty and dependence on inefficient and unhealthy energy sources in developing countries. Once people have a reliable and healthy energy source like what the Patsari stoves provide, they are better able to break out of the vicious cycle of poverty and have more choices regarding their lives and opportunities.

## ECOLIFE's Partners in Uganda

### **Conservation thru Public Health**

Conservation Through Public Health (CTPH) is a non-governmental organization (NGO) based in Kampala, Uganda. CTPH is directed by world-renowned gorilla veterinarian, Dr. Gladys Kalema. Their innovative, integrated approach to gorilla and wildlife conservation focuses on improving primary health care in and around Africa's protected areas by enabling humans, wildlife and livestock to successfully coexist.



CTPH works to prevent and control disease transmission between the closely genetically-related species of humans and gorillas, in addition to cattle and buffalo. Improving the health of local communities, while reducing the interactions between people and the great apes, significantly reduces the possibility of disease transmission. CTPH volunteers from within the communities teach about disease

transmission and livestock and crop management, as well as family planning and sexual and reproductive health topics.

### **Bwindi Community Hospital / Kellermann Foundation**

The well-respected Bwindi Community Hospital in Buhoma provides first-rate healthcare to the entire population of a large area of southwest Uganda. For the past three years, it has been rated the best hospital in Uganda and its community outreach programs reach thousands of Uganda's poorest and most isolated citizens.

The hospital, which began a decade ago as an open-air clinic, was founded by an American physician, Dr Scott Kellermann and his wife Carol. In 2000, they conducted a survey of the local Batwa people and were shocked by what they learned: the life expectancy of the Batwa was 28 years, and four in 10 would die before their fifth birthday. The tribe was dying out, along with its unique culture and intimate knowledge of the forest.

Through the Kellermann Foundation, the Kellermanns have helped the Batwa and other area residents by establishing schools, homes, health clinics, water and sanitation, and income generation programs.

Due to their intimate knowledge of the community and strong network of community health and other outreach

programs, Bwindi Community Hospital is a natural partner for ECOLIFE to help address the underlying health problems associated with indoor cooking fires.





## **Phase One of the Uganda Project – Installation of Patsari-Adapted Stoves**

In partnership with Conservation Through Public Health (CTPH) and the Bwindi Community Hospital (BCH), ECOLIFE will be working in the communities of Bwindi & Buhoma, located at the edge of Uganda’s Bwindi Impenetrable National Park, to build a safe, fuel-efficient stove in every single home (about 400 homes). The use of these vented cooking stoves will greatly improve the health and quality of life for every single member of the two communities.

Phase One of the Uganda Conservation & Community Health Project (UCCHP) will include the hiring and training of Ugandan personnel, performing the actual stove building, education of the families about the stoves, and follow-up monitoring. Thanks to ECOLIFE’s advance team in Uganda who worked in partnership with CTPH, initial Community Needs Assessment interviews (surveys) have already been completed. People in both communities really want the stoves and are anxious to get started.

### **Daniel Kikemu – Africa Program Specialist**

Daniel Kikemu, ECOLIFE’s East African Coordinator, will oversee the stove-building project. ECOLIFE understands the need to have a local representative like Daniel working on the project. As a Kenyan and East African who speaks English and the local Kiswahili language, Daniel is better able to understand the daily needs and issues of the Bwindi & Buhoma communities. In addition, he will be more accepted and effective as a “local” when working with the project’s various partners.

Daniel was recently in San Diego (Sept./Oct. 2012) for training on the Patsari stove-building technique, as currently done in Mexico. However, Daniel will be adapting the stoves to be technologically and culturally appropriate for Uganda & other East African cultures, economies and available materials. For example, Daniel will be making modifications to adapt the cooking surface, such as to a rounded one instead of flat like in Mexico, and making sure the stove can burn different types of fuel (including charcoal made from firewood.)



### **Project Implementation**



Once the stove has been successfully adapted, Daniel will travel from his home in Kenya to Uganda to locate the best suppliers of the various stove components and materials so that actual stove costs and a project budget can be finalized. ECOLIFE will hire a local coordinator – the Bwindi Project Manager - to work with Daniel and ensure continuous and efficient facilitation of the project and the stove building, as well as serve as an available resource to troubleshoot technical problems. A total of 10 local “stove technicians” will be hired to do the actual building of the stoves.

Daniel will provide training for the CTPH and BCH personnel, the project manager and stove technicians on how to build and use the stoves. Daniel and the local collaborators may adapt parts of the construction to increase the possibility of economic development opportunities for local craftsmen, including brick makers and potters. For example, local Bakiga artisans specialize in making bricks with the local clay of the region and the Batwa are renowned as “potters,” so they could hopefully be employed to create rounded cook tops.

The community and families to receive the first stoves will be identified. An initial “pilot” of 10 stoves will be built in spring 2013, after which a thorough evaluation of the building process and stove utilization will be done so that any problems or challenges can be addressed and further refinements made in the stove design



and building process. The project roll-out will then begin in earnest, with an estimated 50 stoves installed in that next quarter, and continuing over the next year until all 400 stoves have been installed.

Family members will be required to assist the stove technicians in the construction of their home's stove and to attend community workshops to help them maximize the value of the stove. These participatory group workshops will be fun, hands-on "applied learning" sessions. Culturally appropriate educational materials about the stoves will also be developed for the families.

### **Phase 2 of the Uganda Project– Additional Ways To Improve Community Health**

ECOLIFE is committed to a multi-year partnership in Uganda, working first on the most critical and easily addressed threats to human health and habitat loss. This is why Phase One of the Uganda Conservation & Community Health Project involves placement of the Patsari-adapted stoves into all homes in the Bwindi and Buhoma communities.

ECOLIFE knows that strong partnerships with the local Batwa & Bakiga people will be built through the process of working together on the stove installations. As people see dramatic results with improved family health and lightened workloads (from needing to collect less firewood), the community's trust of ECOLIFE will deepen. At the same time, ECOLIFE will gain additional – and invaluable – knowledge of the community's needs and challenges. This will automatically lead into the planning and development of Phase Two projects that will benefit the two communities.

Phase Two projects will most likely include the provision of safe drinking water through water catchment systems and helping to develop sanitation facilities to improve health compromised by contaminated water. In addition, ECOLIFE will certainly want to develop aquaponics systems to provide fish protein and fresh produce for families in the community. This sustainable form of agriculture will increase farmers' efficiency and provide an animal protein alternative to the illegal poaching of bush meat – including the meat of protected wildlife.

ECOLIFE would also be interested in working with the local school in Buhoma and the orphanage in Bwindi. ECOLIFE could help create a rainwater collection system similar to the one done in Kenya, where ECOLIFE adopted West Gate elementary school and created enough roof space on the girl's new dormitories to collect most of their drinking water from annual rainfall. ECOLIFE would also want to install an aquaponics unit in those two locations, which could be used to produce food for the students and be part of their educational curriculum. *(see Addendum for more information about aquaponics & the Kenya project)*



## Why ECOLIFE's Uganda Project Is So Important

We hope that ECOLIFE has built a strong case that traditional, narrowly-focused conservation efforts to protect wildlife and the environment cannot be fully realized if people sharing the natural resources cannot also meet their basic needs. ECOLIFE's Uganda Conservation & Community Health Project will serve as a prototype and powerful example of how to bridge the "conservation divide" with practical, affordable and sustainable solutions.



For thousands of years in the Bwindi Impenetrable Forest, the Batwa pygmies lived in harmony with the forest and its creatures. Upon their eviction from the park in 1992, which was done to protect the endangered mountain gorillas, the Batwa became "conservation refugees" and landless peasants. They are now some of the most severely marginalized people in the world, with an average life expectancy of less than 30 years. The very existence of the Batwa people – and their ancient culture steeped in the wisdom of nature – is being severely threatened.

Indeed, the Batwa are "poster children" for the failure of traditional conservation methods – ones that don't take the needs of people into account and include them in the sustainability equation. In the well-intentioned effort to protect the gorillas, the Batwa were moved from their ancestral homes and left to scrounge an existence with little support. Using this project's success, ECOLIFE wants to be a catalyst to shift the conversation to a more holistic, balanced approach to conservation and the alleviation of human suffering by recognizing the inter-relatedness of all life.

The installation of safe, fuel-efficient cookstoves will dramatically improve the health and lives of the people in Bwindi & Buhoma. The community's women and children will no longer have to cook for hours over an open stove in smoke-filled homes, suffering the respiratory and other health consequences that shorten their lives. Parents will not have to watch in anguish as their children suffer the pain of devastating burns caused by falling into open cooking fires.



The project will also help protect the Bwindi Impenetrable Forest, one of the planet's most biologically diverse areas, from further deforestation and loss of habitat for its precious



wildlife. Patsari stoves need 60% less wood for fuel, meaning women and girls will spend much less time collecting firewood and far fewer trees will need to be cut down. This will have a far-reaching impact on the forest's most famous residents – the critically endangered Bwindi mountain gorillas, a huge draw for Uganda's eco-tourism industry.

In addition, a significant decrease in respiratory and other ailments of the people in Bwindi & Buhoma will directly benefit their gorilla neighbors who are prone to many of our same human diseases. Thus, the Uganda Project will lead to greatly increased health & well-being and safety for all living entities – the people, the wildlife, and the forests – of this remarkable yet biologically endangered area of our world.



## How You Can Help / Become Involved

There's an urgency today that can't be ignored. People around the world are eagerly looking for workable, sustainable solutions to such seemingly intractable problems as species extinction, habitat destruction, devastating global human health issues, and climate change.



The conservation conversation must become larger. It's not just about saving wildlife like Uganda's magnificent mountain gorillas; it's about the sustainability of life itself. If we continue to deplete our planet's natural resources and biodiversity and disrupt the delicate balance of our ecosystems, we humans will ultimately pay the price.

At this time in history, more and more people are recognizing their interdependence with the natural world and are desirous of a world that is protective of all forms of life. Unfortunately, there are lots of ideas but few proven successes in tackling the world's biggest conservation issues from a much needed holistic perspective. ECOLIFE has one in the wings – but it'll take 400 stoves!

ECOLIFE & Executive Director Bill Toone have the vision, reputation, knowledge, international experience, and a wide range of professional and East African contacts to successfully implement the Uganda Conservation & Community Health Project – a project that provides innovative, cost-effective and sustainable solutions to improving human health & well-being AND protecting wildlife & the natural environment.

We're ready to get started. The cost of the entire project is estimated at just \$150,000 (*see attached budget*). We're looking for "lead investors" who would like to leverage their financial resources to make a huge impact – and play a key role in history toward creating a more sustainable future.



This prototype Uganda project has real potential for transformation – not just for the people in the Bwindi & Batwa communities who will receive the stoves – but as a demonstration project that will serve as a successful model and catalyst for “bridging the conservation divide” and bringing innovative new global solutions to the world's table. We all have a role to play. We hope you will consider joining with us to make this important project a reality!

## ADDENDUM PAGES

### AQUAPONICS

Aquaponics is the science of raising vegetables and fish in a closed re-circulating system – essentially the marriage of fish farming and hydroponics. It is a biologically efficient and fully organic system producing about 70 lbs of greens for every 1 lb of fish. Perhaps more importantly, it grows these vegetables using only 10% - 20% of the land and water required for traditional agriculture.

Although simple forms of aquaponics were used over a thousand years ago by the Chinese, Thai and Mayans, the private and commercial application of this emerging trade is just now entering the mainstream. ECOLIFE has been implementing aquaponic programs in San Diego and Uganda for over three years, realizing the potential importance of this powerful and sustainable technology for addressing deforestation issues associated with expanding rural agriculture.

Aquaponics provides near zero environmental impacts, removing the need for fertilizers and chemicals from the agricultural process since fish waste acts as a natural fertilizer for the crops. In addition, it provides fresh fish and vegetables for human consumption, thus reducing the need to import food from other areas and countries. The widespread use of aquaponics could greatly reduce fuel consumption associated with food transportation and fertilizers – thereby reducing significantly the communities' carbon footprint.

#### **Providing Fish as an Animal Protein Alternative to Bush Meat In Uganda**

Bush meat refers to meat obtained from hunting wild animals, especially from endangered or protected species. The bush meat trade plagues much of the world's wildlife, especially in Africa and Asia. Many rural communities in Uganda hunt bush meat, both to eat and to sell for a living. Often times, converting communities to cattle or sheep farming has a more disastrous impact on wildlife than the bush meat trade, as their habitat is converted to grazing lands.



As populations continue to grow in cities, as well as in forest logging concessions and mining camps, the demand for wild meat rises. However, bush meat hunting is not easy. As habitat is lost and species decline, the hunters need to spend more and more time traveling further from home to find animals to hunt. Unlike some other areas in East Africa, fish are in high demand in Uganda. Therefore, aquaponics can provide an animal protein alternative that is sustainable and will reduce the pressure on the native wildlife of Uganda.



## SAMBURU, KENYA PROJECT

### **About the Samburu People & Samburu National Reserve**

In the shadow of Mount Kenya, the national parks and extensive ranch and communal lands of the Samburu Heartland support some of Africa's most impressive wildlife and wild lands. The Samburu people have co-existed with the wildlife for hundreds of years. They are semi-nomadic pastoralists who herd mainly cattle but also keep sheep, goats and camels. The Samburu are a Nilotic people of north-central Kenya that are related to, but distinct from, the better-known Maasai (who are also pastoralists and live in Kenya & northern Tanzania).

There are many game parks in the Samburu Heartland but Samburu National Reserve is one of the most well known. In fact, it was one of two areas in which conservationists George & Joy Adamson raised Elsa the Lioness, made famous in the best-selling book and award-winning movie *Born Free*.

### **Wells vs. Rainwater Collection Systems**

Many groups implementing water programs in the Samburu region focus on using wells. Unfortunately, wells create multiple challenges including high installation costs and the need for on-going maintenance dollars, along with specific tools, parts and skills. Wells deplete ground water and in doing so, begin pulling toxins like arsenic to the surface. Once a well part breaks, people often return to collecting unsanitary water rather than spend their limited funds on repairs. Unlike wells, ECOLIFE's water collecting system takes advantage of rainfall as a good source of clean drinking water and protects ground water resources necessary during times of drought.

### **ECOLIFE Projects at West Gate Primary School**

Samburu children who reside on the western boundary of the Samburu National Reserve have been unable, for many years, to have access to a quality basic education due to various reasons such as persistent drought, cultural clashes between ethnic groups, and lack of enough teachers and infrastructure in the school. The Kenya government had built a small public school called Lpus Leluai /West Gate primary school, which was meant to serve the local community in the area.

ECOLIFE, in collaboration with Save the Elephants, constructed a dormitory that will accommodate an average of fifty girls. This initiative was chosen in recognition of the fact that girls from the community were particularly vulnerable and lacked safe housing. As a result of having girl's dormitories, the number of girls attending school has tripled. The global impact of educating girls in helping to reduce poverty and future family sizes is well documented. In addition, girls without basic education are often forced into early marriages, suffering a lifetime of negative consequences.

Using roof space from the new dormitories and existing classrooms, ECOLIFE also implemented an innovative, self-sustaining rainwater collection system to provide clean drinking water for the approximately 300 elementary school students at the West Gate School.

Before this, the nearest water source was inside the Samburu Reserve at the Ewaso Ng'iro River, which unfortunately is not safe to drink and placed the children in competition with potentially dangerous wildlife. With the new system, children at the school no longer have to walk for miles into the reserve to collect water from a source that is shared by African elephants and other wildlife.



In 2011, ECOLIFE provided the school's kitchen with a fuel-efficient stove, replacing a smoky open fire. West Gate's hard-working cook, who produces three meals a day for more than 300 students, is deeply appreciative of his much healthier and clean work environment.