

THE UNTOLD STORIES OF CONSERVATION:
IMPORTANCE OF SOCIAL CAPITAL INVESTMENT IN
COMMUNITY-BASED CONSERVATION EFFORTS

By

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Author's Note

Working alongside Dr. Dieter Steklis, the former director of the Dian Fossey Gorilla Fund's Karisoke Research Center, and his wife, Dr. Netzin Steklis, a primatologist, I became incredibly interested in mountain gorilla conservation. For two years at the University of Arizona, we have brainstormed and researched the importance of biological conservation for mountain gorillas. We have also discussed which conservation strategies have produced the most successful outcomes in terms of ecological success, such as an increase in population numbers. Part of this thesis explores our findings on mountain gorilla conservation. This part of my thesis is built upon the Steklis' incredible knowledge base from decades of research on primate behavior and conservation, including over 20 years of work on the Dian Fossey Gorilla Fund. In addition, I will describe orangutan conservation projects, including the Orangutan Project and Orangutan Republik Foundation. Orangutan conservation has been one of my biggest personal and academic passions for as long as I can remember. From the analysis of these conservation organizations, I will describe commonalities between these efforts and identify any current social capital building programs. Based on these findings, I will further identify ways in which these organizations can improve social capital building in their programs to improve the outcomes of conservation strategies. I plan to continue researching the importance of community-based conservation and investment into human social capital in the fall of 2023 at Oxford Brookes University.

Abstract

Community-based conservation (CBC) is a global conservation method that combines local ecological knowledge with international expert knowledge to analyze a conservation project from many perspectives with goals to protect biodiversity while simultaneously and directly improving the local community. Despite the massive number of endangered and critically endangered species globally, installing programs and projects to preserve this incredible flora and fauna is still possible. An analysis of a systematic review of 136 conservation projects (Brooks et al. 2013) was conducted to 1) explore the significance of involving local communities in conservation efforts and 2) to determine which strategies work best for ensuring conservation success. This systematic review aimed to identify and evaluate the success of CBC projects from four domains: attitudinal (whether people have positive or negative feelings towards the project), behavioral (whether people engage more in beneficial behaviors related to the conservation project), ecological (whether the habitat conditions or population of key species improved), and economic (whether the community received economic or developmental benefits) (Brooks et al. 2013).

Among the 29 variables that were explored during this systematic review, only two variables displayed over 50% improvement across all four domains: approximate local culture (59.25% improvement) and social capital (61% improvement) (Brookes et al. 2013). The variation of success in this review of so many conservation projects indicates the importance of proper project design to ensure maximum biological conservation success and improve local attitudes and behaviors towards conservation. For optimal efficiency of conservation efforts and sustainability, it appears to be imperative to create conservation programs that enhance social capital, or enrich human livelihood, in local communities. By providing sustainable programs to

enrich these communities, locals are more likely to have positive attitudes and behaviors about conservation while also benefiting from ecological and economic success directly from their efforts. Combining local ecological knowledge, cultural programs, and international expertise in conservation to improve social capital seems to be an effective conservation strategy, necessary for environmental restoration (Brooks et al. 2013).

Importance of Biological Conservation

Conservation projects have become increasingly important as human actions continue to devastate Earth's environments. According to the International Union for Conservation of Nature (IUCN), approximately 28% of all known species worldwide are currently threatened with extinction. The National Park Service speculates that over 75% of all living species are indigenous to the tropics ("Wildlife of the Tropical Rainforests" 2019). Not only are tropic environments the most biodiverse, they are also the most threatened regions in terms of habitat destruction and the increasing number of endangered species. Rainforests are estimated to lose over 6,000 acres of land every hour primarily due to human deforestation ("Wildlife of the Tropical Rainforests" 2019). As tropical rainforests are destroyed for logging and/or agriculture, indigenous species are killed or driven to highly fragmented areas. Many of these species become endangered or go extinct ("Wildlife of Tropical Rainforests" 2019).

Tropical rainforest destruction also has a significant impact on the Earth's climate. When fewer trees are present, less carbon dioxide gets absorbed and less oxygen released into the atmosphere via photosynthesis. This causes global temperatures to increase and habitats are transformed worldwide ("Wildlife of Tropical Rainforests" 2019). Rapid environmental changes resulting from climate change are linked to higher rates of extinction ("Species and Climate Change" 2022). Therefore, action to conserve tropical rainforests is desperately needed to save many endangered and soon-to-be endangered species. For each species that we lose, we lose a source of biological, physiological, and ecological knowledge. As we change the climate of our environment, we increase the risk of making it uninhabitable to more and more species, including one day perhaps, ourselves.

Conservation is essential as biologists have only begun to understand the past and present of complex organisms in the most biodiverse habitats on Earth (Hampe & Petit 2005). Human industrialization and the resulting impacts on Earth's ecosystems continue to worsen the conditions of our planet. The Rainforest Foundation Norway reports that approximately 64% of the world's tropical rainforests have been destroyed since the beginning of the Industrial Revolution (Rainforest Foundation Norway 2021). These effects are so extreme that some scientists believe we are in the midst of a sixth mass extinction, approaching a "planetary-level tipping point" (Côté et al. 2016). Deforestation further increases the effects of climate change and reduces the habitat available for millions of species (Keil et al. 2015). Tropical rainforests worldwide, the most biodiverse ecosystem on the planet, are continuously being cut down for human use. In the past decade alone, 10% of the world's tropical rainforests have been destroyed (Rainforest Foundation Norway 2021). As a result, most of these tropical species suffer, often causing irrecoverable outcomes, including inbreeding depression and lack of genetic diversity (Sen & Ravikanth 2022). A lack of diversity further can then affect a species' ability to adapt to future conditions.

Approximately 90% of species within the primate order are restricted to tropical rainforest biomes (Mittermeier 1988). As our closest living relatives, the study of nonhuman primates has great potential to inform us on humans' evolutionary history. As we lose primate species due to deforestation and climate change, we lose our ability to answer important evolutionary questions about them and potentially also ourselves. In addition, primates perform important roles from an ecological perspective. These roles include consuming plants, creating canopy gaps, and acting as seed dispersers (Chappell & Thorpe 2021). Therefore, the environment primates occupy will be devastated if primates become extinct.

The tropics are home to millions of plant and animal species, many indigenous people, and many poor, rural communities (Sen & Ravikanth 2022). With increased forest fragmentation, tropical ecosystems are negatively impacted, affecting the lives of the local communities in these areas who depend on resources in these forest habitats. Altering rainforest landscapes has reduced the abundance of seedling growth and production rates (Sen & Ravikanth 2022). In addition, pollinator production and movement are decreased when forests are fragmented, further affecting rainforest vegetation (Sen & Ravikanth 2022). Orangutan diets, for instance, are incredibly diverse due to inconsistent food availability, so their role as seed dispersers within their environment is essential (Chappell & Thorpe 2021). With an increase in habitat loss, primates like orangutans are struggling to not only find food, but lack an ability to disperse seeds effectively to support their environment (Chappell & Thorpe 2021). Furthermore, habitat fragmentation due to deforestation has also been linked to increased invasive species (Sen & Ravikanth 2022). This invasion of foreign species could further affect the rainforest biodiversity of local plants and animals and decrease available resources for human use. These effects all decrease the available resources for local communities.

Brief History of Conservation

Biological conservation methods have been prevalent for hundreds of years. Beginning as early as the late 15th century, biologists like John Evelyn proposed ideals of preservation of natural resources in England (Mason 2017). The first National Park in the world, Bogd Khan Uul, was established in 1783 in Mongolia to protect its beauty (Mason 2017). As time went on, colonization became a major contributing factor to conservation practices. When Europeans migrated to the United States, much of the land was developed into agricultural lands.

Indigenous peoples, who tended to have more environmentally friendly lifestyles (Mason 2017), were pushed out of their lands. Industrialization eventually destroyed a large portion of America's natural environments by introducing large factories that required lots of fossil fuels and released lots of carbon dioxide into the atmosphere (Mason 2017). During the Early Industrial Age, several countries like Prussia and France began to institute biological management systems to reduce the risk of loss of biodiversity and natural resources for human use (Mason 2017). While many of these systems failed due to lack of enforcement, this was just the beginning of global conservation efforts and strategies.

By the height of the Industrial Age in the late 19th century, conservationists and biologists became truly aware of just how much impact humans had on the environment as the science of climatology began to develop (Mason 2017). Several of these environmental activists argued that humans had a moral obligation to ensure global environments were preserved for future communities (Rome 2003). During the mid-1800s, conservationist Henry David Thoreau argued that humans should live with nature, rather than exploit it. (Mason 2017). The rapid increase of urbanization and industrialization in the United States during the late 1800s led to the institution of Yellowstone National Park, the first National Park in the United States and second in the world, established in 1872 (Mason 2017).

Around the turn of the 20th century, two main viewpoints arose regarding how to manage natural resources and land. Conservationists like Thoreau believed in finding a balance between human use and natural resource extraction, while preservationists like John Muir believed these lands should remain untouched ("Theodore Roosevelt and Conservation" 2017). Theodore Roosevelt largely contributed to the introduction of conservation institutions within the United States during his term between 1901-1909, establishing organizations such as the U.S. Forestry

Service as well as five new National Parks across the country (“Theodore Roosevelt and Conservation” 2017). Throughout the 1960s and 1970s, many more organizations were created to further protect the environment in the U.S. such as the Environmental Protection Agency, Sierra Club, and Wilderness Society (Rome 2003). As it became clearer that human industrial actions were deeply affecting the environment and global climate, mostly due to pollution and environmental destruction, conservation biology became more prevalent to ensure protection of global biodiversity and habitats (Rome 2003).

Methods of conservation have evolved over time. In the mid-1900s, a lot of global conservation efforts were led by an expert-based approach (Rome 2003). This involved the relocation of experts into foreign areas to work on conservation projects at the source. However, most of these projects did not include local communities, and if locals were included, they were often not recognized (Rome 2003). Famously, Dian Fossey spent a large portion of her life studying mountain gorillas in central-east Africa (“Dian Fossey Biography” 2023). While her success stemmed largely from the people she met along the way; specifically, the locals that worked with her and guided her due to their deep knowledge of the landscape, (“Dian Fossey Biography” 2023) Fossey did not promote the health of nearby communities. Instead, Fossey is also famously known for alienating herself from nearby communities whose members sometimes relied on the gorillas she studied as a source of food (Rome 2003).

Eventually, by the 1970s, a more interdisciplinary approach in conservation was introduced that combined the expert-based approach with local community involvement (Berkes 2004). Most of these expert plus community-involved conservation projects took place in the 1970s and 80s, focusing on the specific needs of each local community to better incorporate resource management and social organization (Berkes 2004). Local communities benefited due

to the economic value of local species through systems like ecotourism (Berkes 2004). However, many local institutions did not agree with the use of resources or goals of the conservation projects (Berkes 2004). Conservation projects therefore still needed changes to their design to ensure maximum success.

As a result, during the 1980s and 90s, community-based conservation (CBC) was introduced as the need to involve local communities more directly and comprehensively in conservation projects was recognized (Berkes 2004). This method combines local ecological knowledge with international knowledge to analyze a conservation project from many perspectives to protect biodiversity while directly improving the local community (“What is Community Conservation?” 2022). With CBC, locals are involved from the beginning of the project to ensure the community’s needs, values, and goals are met throughout the process (“What is Community Conservation?” 2022). For instance, locals can benefit from better living conditions or access to more resources if the local ecosystems are protected or adequately managed. This comes from combining the needs of local human communities with the needs of local wildlife populations in order to create a sustainable balance between the two. Incorporation of local and traditional ecological knowledge and inclusion of locals in research and conservation efforts aided in empowering these communities beyond the pure financial benefits of ecotourism (Berkes 2004). The productivity of CBC conservation efforts increased as locals were able to serve as active participants in saving their own home environments and natural resources (Berkes 2004). There are many examples of CBC projects started within the last 40 or so years with variations in the way they have been implemented along with projects that have not been community-based. A productive next step therefore is to evaluate the successes of these conservation projects and attempt to identify which strategies seem to be most effective.

Impacts of Community-Based Conservation (CBC)

When implementing conservation strategies, it is essential first to acknowledge and understand the stressors in a particular ecosystem or population. With this knowledge, reasonable efforts can be made to intervene and protect at-risk populations (Côté et al. 2016). While it is often more realistic to reduce the stressor rather than eliminate it, adaptive management for long-term monitoring can aid in identifying the most pressing needs and working through them as they present themselves (Côté et al. 2016). These strategies can improve human communities and the endangered species in the surrounding environment – enhancing the livelihood of indigenous and rural communities living in tropical regions as their access to resources increases.

Since the establishment of Yellowstone National Park as a protected area in 1872, environmentalists have struggled to balance their work and involvement with the local community in and around the park (Andrade & Rhodes 2012). Conflicts between park rangers and locals are standard worldwide across all National Parks (Andrade & Rhodes 2012). When local involvement is ignored, conservation policies become difficult to enforce, as there is often little trust and respect between locals and policy enforcers (Andrade & Rhodes 2012).

Although it is now known how important including local communities is in conservation efforts, it is essential to recognize how to properly evaluate the success of a conservation project and what specific factors are used to measure success. For instance, which variables of a CBC project allow for successful conservation outcomes? A systematic review in 2013 analyzed 136 different projects from over 40 countries to better understand these components of CBCs (Brooks et al. 2013). This review evaluated success across four domains defined in Table 1: attitudinal, behavioral, ecological, and economical (Brooks et al. 2013).

Domain/Outcome	Definition	Measurable Examples
Attitudinal	Project outcomes with regard to local attitudes towards the project or conservation	<ul style="list-style-type: none"> ● Participation ● Sense of belonging
Behavioral	Project outcomes with regard to local resource use or unethical behavior	<ul style="list-style-type: none"> ● Poaching ● Illegal logging
Economic	Project outcomes with regard to economic or other community development benefits	<ul style="list-style-type: none"> ● Job opportunities ● Educational institutions
Ecological	Project outcomes with regard to condition of the habitat and/or key species	<ul style="list-style-type: none"> ● Forest cover ● Number of species

Table 1: Definition and measurable examples of all four conservation outcome domains: attitudinal, behavioral, economic, and ecological.

All of these outcomes were coded as either a success (most indicators show improvement), limited success (some indicators show improvement), or failure (most indicators show no improvement or decline)(Brooks et al. 2013). Among 29 conservation project variables that were explored during this systematic review, only two variables displayed over 50% improvement across all four domains: approaching local culture (average of 59.25% improvement) and social capital (average of 61% improvement) (Table 2).

	Variable name	Attitudinal success	Behavioral success	Ecological success	Economic success
NC1	Governance		2.42		
NC1	Rights				
NC2	HDI	2.56	2.35		
NC2	Gini	1.94			
PD1	Impetus		0.36	0.68	
PD1	Establishment	0.41	0.38	0.47	
PD1	Decision-making	0.34	0.38	0.38	0.42
PD1	Approach local culture	0.55	0.56	0.70	0.56
PD1	Approach local institutions	0.46	0.63	0.81	0.45
PD2	Protectionism			0.45	
PD2	Resource use				
PD3	Economic benefits				
PD3	Equitable distribution	0.47	0.58	0.56	
PD3	Elite capture	0.62	0.60	0.44	0.45
PD4	Capacity skills	0.42	0.53	0.60	0.50
PD4	Capacity institutions	0.63	0.57	0.69	0.48
PD4	Social capital	0.78	0.63	0.50	0.53
PD4	Environmental education	0.34	0.33		
CC1	Market integration				
CC1	Threat				
CC2	Supportive local culture		0.34		
CC2	Effective local government		0.47	0.59	
CC2	Tenure	0.33		0.28	0.34
CC2	Charisma				
CC3	Population size		0.34		
CC3	Population heterogeneity				
CTR	Ecoregion status				
CTR	Author discipline				
CTR	Years project running				

Dark cells indicate a significant association between independent and dependent variables. Analyses were conducted on the dataset that included missing values (not imputed data).

Table 2: The two out of 29 variables (highlighted) that were associated with over 50% success across all four domains for conservation projects that incorporated these variables. Success variables and rates from Table 9 in systematic review (Brooks et al. 2013).

Approaching local culture refers to the incorporation of local values, traditions, and customs into the conservation project. Social capital refers to the enhancement of an individual or community's life, typically through educational programs or funding for community institutions. Therefore, the study concluded that the creation or enhancement of social capital and engagement with local cultural traditions and institutions, all while ensuring local participation in the project are likely to produce the most success in CBC projects (Brooks et al. 2013). This

review of so many conservation projects indicates that proper project design is important to ensure maximum biological conservation success and improve the local communities' attitudinal, behavioral, and economic success.

Overview of Social Capital in Conservation

Several of the variables that are hypothesized to influence success of CBC projects, relate to the success of a conservation ecosystem, as measured by attitudes, behaviors, and ecological and economic domains. For example, analysis of the data for this study on participation and engagement indicates that conservation projects were 61% more successful when there was more emphasis on local participation (Brooks et al. 2013). Brooks et al. (2013) also found that conservation projects are more likely to succeed when they invest in human social capital, meaning that the lives of the individuals involved are enhanced or benefit from joining the conservation effort. An example would be creating a sense of community or culture in conservation efforts within local communities. In addition, the charisma of a leader and trust in local communities are higher when locals participate in conservation practices (Brooks et al. 2013). These findings suggest that local community involvement in conservation projects not only benefits the community, but also aids in producing successful conservation efforts. Figure 1 illustrates the pathway to success when a conservation project focuses on enhancing social capital in a community.



Figure 1: Variables involved in pathway to successful conservation when social capital is incorporated.

Conservation project design is important because, without proper, distinct plans, CBC efforts can quickly fail. Therefore, it is essential to overcome national-level and community-level circumstances that might otherwise inhibit project success (Brooks et al. 2013). Furthermore, as supported by this meta analysis, the vital components of project design associated with successful operations include capacity building, equitable distribution of resources, creating or enhancing social capital, engaging with local cultural traditions, institutions, and leaders, and ensuring local participation in project initiation (Brooks et al. 2013). When these components are applied to each unique community involved in CBC projects, their efforts are more likely to allow for success ecologically and socially within their communities.

Given that community engagement seems to be critical for successful conservation projects, it is relevant to understand when and why people are motivated to participate. In 2021, Harvard Business Review conducted a study to better understand how social workers are motivated to do their job well. They found that recognizing members or employees of an organization in a personalized manner, such as by acknowledging their individual efforts at public events, increased motivation, performance, and retention among these members and employees (O’Flaherty et al. 2021). It also benefited the organization as employees were more likely to perform their jobs productively and accurately (O’Flaherty et al. 2021). In addition, the Harvard Business Review study found that when awards of recognition were shared publicly, those that were awarded and those who witnessed the recognition had notably increased performances afterward, as measured by the study’s many surveys (O’Flaherty et al. 2021).

These concepts can be applied to increasing social capital in conservation projects. For example, publicly recognizing an action by a community member could improve the overall performance of the work done by a community on a conservation project. People are more likely to participate in conservation efforts if they get something out of it, whether it’s simply individual recognition or something much more significant such as a fulfilling job with a sustainable salary. This increased participation is likely to improve both the conservation project as well as other aspects of their entire community such as trust and reciprocity between individuals (Brooks et al. 2013). This act of community member empowerment in conservation projects and organizations further increases motivation of community members and encourages a sense of belonging — a fundamental human desire.

A survey study in Victoria, Australia, across six different rural communities concluded that CBC efforts helped increase the local sense of community and belonging (Moore et al.

2006). This study established that the majority of individuals involved in conservation efforts showed improved health and overall well-being after their involvement in a CBC project (Moore et al. 2006). Compared to their control counterparts who did not participate in conservation efforts, individuals engaged in CBC reported a higher willingness to participate in future conservation projects (Moore et al. 2006). By focusing on building social capital, individuals felt proud of their direct involvement and would likely feel more inclined to continue their contributions, as supported by the study's survey (Moore et al. 2006). Therefore, the results of CBCs seem to be creating a more sustainable system for conservation that benefits people within communities while enriching the environment around them by living with the land rather than on it.

Role of Social Capital in Conservation Organizations

Below I describe three conservation organizations that I reviewed to better understand the prevalence of social capital building programs in CBC efforts for primate CBC projects specifically. Information was collected from each conservation organization's website, and interviews were conducted with key members of each organization. The goal of this research was to identify the specific practices that were put in place for local communities to build social capital. For instance, are local participants recognized for their contributions? What are their roles in the projects? How do these organizations build sustainable conservation practices through CBC projects? These factors related to community involvement are important to consider since they have been shown to be effective for the success of conservation projects, but are not applied equally to all projects. Below I will investigate whether the below primate conservation projects/organizations are actively building social capital.

Analysis of Social Capital Investment in a Mountain Gorilla Conservation

Project

The wild mountain gorillas in the Virunga Volcanoes National Park straddling Rwanda, Uganda, and the Democratic Republic of Congo are the target of a well-known successful conservation endeavor called the Dian Fossey Gorilla Fund. This long-term conservation project employs a multi-faceted approach that includes anti-poaching patrols, daily monitoring of gorillas by rangers, conservation education programs in surrounding schools, local university student participation in research, and some community engagement activities (“Helping Communities” 2023). Local communities have been inextricably involved in the 50+ years of conservation activities, either directly as employees or indirectly as family and friends of employees. Many locals take pride in their contributions to the work of the Dian Fossey Gorilla Fund. As a result, it is common for several family members to contribute in some capacity across multiple generations (Golder 2023).

Social capital is an effective component of successful conservation programs, shown to enhance all four measures of successful conservation outcomes: attitudes, behaviors, ecological, and economic (Brooks et al. 2013). To assess the role of social capital in this project, Drs. Steklis and I interviewed Erika Archibald, the relations and communications specialist for the Dian Fossey Gorilla Fund. While the main goal of the Dian Fossey Gorilla Fund is to improve conservation efforts for mountain gorilla populations in the area, many programs are also in place to better the lives of the people within the surrounding communities. For example, livelihood programs that are funded by the project in Rwanda, Uganda, and the Democratic Republic of the Congo include providing literacy training for children and adults in local communities (E. Archibald, personal communication, February 2023). The Dian Fossey Gorilla

Fund also provides capacity-building programs to train the next generation of conservationists through educational opportunities for secondary school children in Rwanda (E. Archibald, personal communication, February 2023). These opportunities include providing teacher training and course lesson plans, school supplies, and even field research excursions (“Helping Communities” 2023). Another example of investment into social capital by this project is providing funding and physical infrastructure for vegetable gardens and materials for individual families who live in Rwanda (“Helping Communities” 2023). This investment helps improve food security and as a result, overall family health. At the same time, family gardens reduce human reliance on natural resources from the forest that gorillas also rely on.

As described above, individual recognition for conservation contributions has been found to increase conservation project group performance and satisfaction (O’Flaherty et al. 2021). To achieve this, the Dian Fossey Gorilla Fund gives out Gorilla Protection Awards to exceptional trackers, anti-poaching patrols, and other staff for their contributions. They also write monthly newsletters for their public website where contributors recognize the work done by local staff members or volunteers of the Gorilla Fund. For example, an article on the organization’s homepage highlighted four new female trackers who were hired from local communities (Golder 2023). This is significant, as it is almost always men who hold tracker or poaching patrol positions in conservation organizations. By sharing the story of these incredible women, including Jacqueline Ntakirutimana and Aline Dufitumukiza, many other young women from local communities and world-wide have highly visible role models doing this work. Expanding more positions to women enables more community involvement and enhanced social capital for the project.

To better address social capital, Drs. Steklis and I took inspiration from the long-retired Dian Fossey Gorilla Fund staff, who felt compelled to add their stories and contributions to the mountain gorilla success narrative. We compiled a database of these previously unrecognized community contributions by collecting photos and interviews. By recognizing and enhancing the visibility of earlier human social capital contributions, we hope to create a “Conservation Champions” kiosk within the Ellen DeGeneres Campus of the Dian Fossey Gorilla Fund, adjacent to the Volcanoes National Park in Rwanda. We envision a large video screen display where community members can query a database to see how their family and friends contributed to gorilla conservation. For example, visitors could type in the name of a friend or family member to find out if they had worked as a ranger, cook, driver, or something else, and how this role helped enable the success of the project. In addition to the video database, photos and audio recordings of interviews will be displayed on nearby walls. We hope that visitors from nearby communities will be inspired by the stories they see about their friends and family on how they helped to save mountain gorillas. We also hope to create a website containing the same database as on the kiosk, so individuals across the world can access unrecognized community contributions worldwide and perhaps become inspired to contribute donations or volunteer with the project on their travels. A well-designed and highly visited website could inspire other conservation organizations to more fully recognize community contributions.

Analysis of Social Capital Investment in Orangutan Conservation Projects

According to the IUCN, all three orangutan species are critically endangered which means that they are likely to go extinct without human intervention and conservation efforts. The Orang Utan Republik Education Initiative (OUREI) and Orang Utan Republik Foundation

(OURF) aim to save and rehabilitate the rainforests where orangutans live on the islands of Borneo and Sumatra in the countries of Indonesia and Malaysia (“About Us” 2022). Their specific goals are to improve the habitats where orangutans live and create sustainable human initiatives for local communities (“About Us” 2022). An example of this would be proper use of natural resources or community engagement programs.

Projects by the OURF that are likely to improve social capital include programs to reduce human-orangutan conflict over land, introduction of sustainable livelihood techniques that benefit both community members and nearby orangutans by protecting forest land, and providing funding for educational opportunities for Indonesian and Malaysian citizens of all ages (“About Us” 2022). One of the education programs run by the OURF includes the *Community Education and Conservation Program*, which provides training and educational opportunities to villages near Gunung Leuser National Park in Indonesia (“About Us” 2022). The program enhances social capital by providing opportunities to learn about conservation and become an active participant in CBC efforts, all while conserving orangutans. This particular park in Indonesia is a highly biodiverse rainforest habitat that is home to thousands of orangutans. It has been a central focus for orangutan conservation efforts because of the large number of wild orangutans living within its border. Another set of education programs funded and created by the OURF provides Indonesian and Malaysian students with research grants and higher education opportunities to encourage biological curiosity and exploration and better enable research projects of local residents (“About Us” 2022).

The OURF also has several ecotourism programs to help support communities living near orangutan habitats by giving almost all of the profit directly back to the community (“About Us” 2022). This money can be used however the community may see fit, such as improving local

infrastructure. Allowing local communities to decide how to use ecotourism money is an important aspect of CBC efforts because locals directly benefit economically, rather than the money profiting the conservation organization. All of these projects and programs seem to have increased the social capital of local communities that have promoted active conservation efforts. This is evident by the institution of over 100 educational programs and 25 community building programs as of 2021 across Indonesia and Malaysia, along with increased levels of local participation (“About Us” 2022).

To better understand efforts to elevate social capital within the orangutan conservation community, I interviewed Dr. Gary Shapiro who has decades of experience with orangutans across many conservation organizations. The OUREI was established in 2004 by Dr. Shapiro, an orangutan researcher and freshwater ecologist, and his Indonesian wife, Inggriani. In 2007, the OURF was created to support the OUREI in Indonesia. Shapiro now serves as the president of the OURF and board member of the Orangutan Project, another international orangutan conservation program with projects across Indonesia and Malaysia. Since 2016, the OURF has served as the U.S. branch for the Orangutan Project. Since individual recognition for conservation contributions has been shown to be associated with increased group performance and satisfaction (O’Flaherty et al. 2021), the OUREI and OURF have incorporated many ways of recognizing the work of individuals who have worked on their projects. For example, the OURF has a section dedicated to publicly profiling volunteers and staff on its website (“About Us” 2022). In addition, the organization often includes a profile in their newsletters, to share with the public and contributors, that highlights the work of one individual each month (G. Shapiro, personal communication, February 2023). A more formal event, the Pongo Environmental Awards, recognizes outstanding individuals and partner organizations for supporting and

engaging in orangutan conservation efforts (G. Shapiro, personal communication, February 2023). During the Pongo Awards, various volunteers who have excelled during the year are recognized by receiving a certificate during the event which is attended by volunteers, staff, and local supporters (G. Shapiro, personal communication, February 2023). All volunteers for OUREI and OURF are recognized in a visual presentation showing their photos and a short biography during the event (G. Shapiro, personal communication, February 2023). The institution of a “Conservation Champions” kiosk or website could be a valuable addition to these recognition efforts by providing a historical record of individual contributions over generations. This kiosk and/or website could inspire friends, family, and other future contributors to conservation to add their own conservation stories.

Future Steps for Conservation and Implications for Conservation

Organizations

Most contributions made by individuals over the past few decades across hundreds of conservation organizations are unrecognized. The stories of these individual contributors, from cooks for a research site to trackers in the rainforest, often go untold. The present analysis of the Dian Fossey Gorilla Fund, the Orang Utan Republik Foundation/Orang Utan Republik Educational Initiative, and the Orangutan Project, are good examples of organizations that have projects and programs aimed at increasing human social capital. Furthermore, these conservation organizations have specific programs aimed at recognizing the work of volunteers and contributors. Recognizing individuals and providing opportunities for local community members by making sure to acknowledge and incorporate local values and institutions into conservation projects is likely to help these projects succeed. Providing opportunities for local communities to

participate in conservation efforts is associated with more successfully improving ecological and biological concerns and local attitudes and behaviors towards conservation. In addition, these conservation projects are creating economic opportunities through jobs for locals and ecotourism programs.

Despite the high number of endangered and critically endangered species globally, installing programs and projects to protect this flora and fauna is still possible. The importance of CBC has already been established, but the need to enhance social capital, that is, make sure that the lives of the individuals who are involved with and affected by the conservation project are improved, is likely key to the success and sustainability of a conservation project. Unfortunately, the human species has been the cause of a majority of conservation concerns globally. It therefore seems like it is our responsibility and moral obligation to protect the plants, animals, and habitats we have endangered from extinction. Analyses of successful conservation projects indicate that the best action to combat extinction and protect our remaining species and habitats is to use CBC efforts. These CBS projects aim to improve the lives of the local communities involved and affected. If done so in a manner that is unique to each community, by incorporating local customs and values, there will be enhanced success in all four domains of conservation: attitudinal, behavioral, economical, and ecological.

Recognizing the importance of individual community member contributions to conservation efforts will also aid in increasing locals' participation, attitudes, and behaviors. Whether in the form of a “Conservation Champions” kiosk, website, documentary, or something else, recognition in any form goes a long way in building social capital. Supporting cultural beliefs and institutions would likely be successful in tropical region communities where

conservation concerns are most pressing — further improving biological success and building communities by directing local attitudes and behaviors toward successful conservation outcomes.

Conclusion

With the worsening ecological conditions of our planet and the survival of millions of species at stake, it is imperative to create conservation programs that are sustainable and effective. While community-based conservation organizations are often successful, greater investment in human social capital is likely to make these organizations even more successful. A system that benefits everyone is established by creating programs that enrich and engage local communities to conserve local ecosystems. Humans are primarily responsible for ecological destruction and continue to do so at alarming rates. And yet, humans are the only species capable of restoring our planet.

Combining local ecological knowledge and cultural programs with international, expert knowledge on conservation will be necessary for environmental restoration. Furthermore, the integration of locals in community-based conservation enhances social capital. This encourages sustainability in conservation efforts as local attitudes and behaviors towards conservation become more positive and are likely to continue. In addition, conservation projects should ensure that their efforts benefit local communities economically. That is, conservation projects are unlikely to succeed if members of local communities will benefit more by exploiting opportunities in their environments rather than conserving nearby environments. Therefore, we all must encourage the development of a world where humans live in concert with their surrounding environments rather than overexploiting them. There must also be a recognition for the humans actively making a change to improve conservation related attitudes and behaviors.

The untold conservation stories of the people involved in these global projects ultimately have the power to change the world and inspire humans to make a difference.

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