Developing an In Situ Conservation Education Program in Rwanda

a case study of the Dian Fossey Fund's Primary School Program around Volcanoes National Park

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Disney and other conservation-minded organizations around the world, including the Fossey Fund in Rwanda, strive to build awareness of the vital connection between humans and nature.

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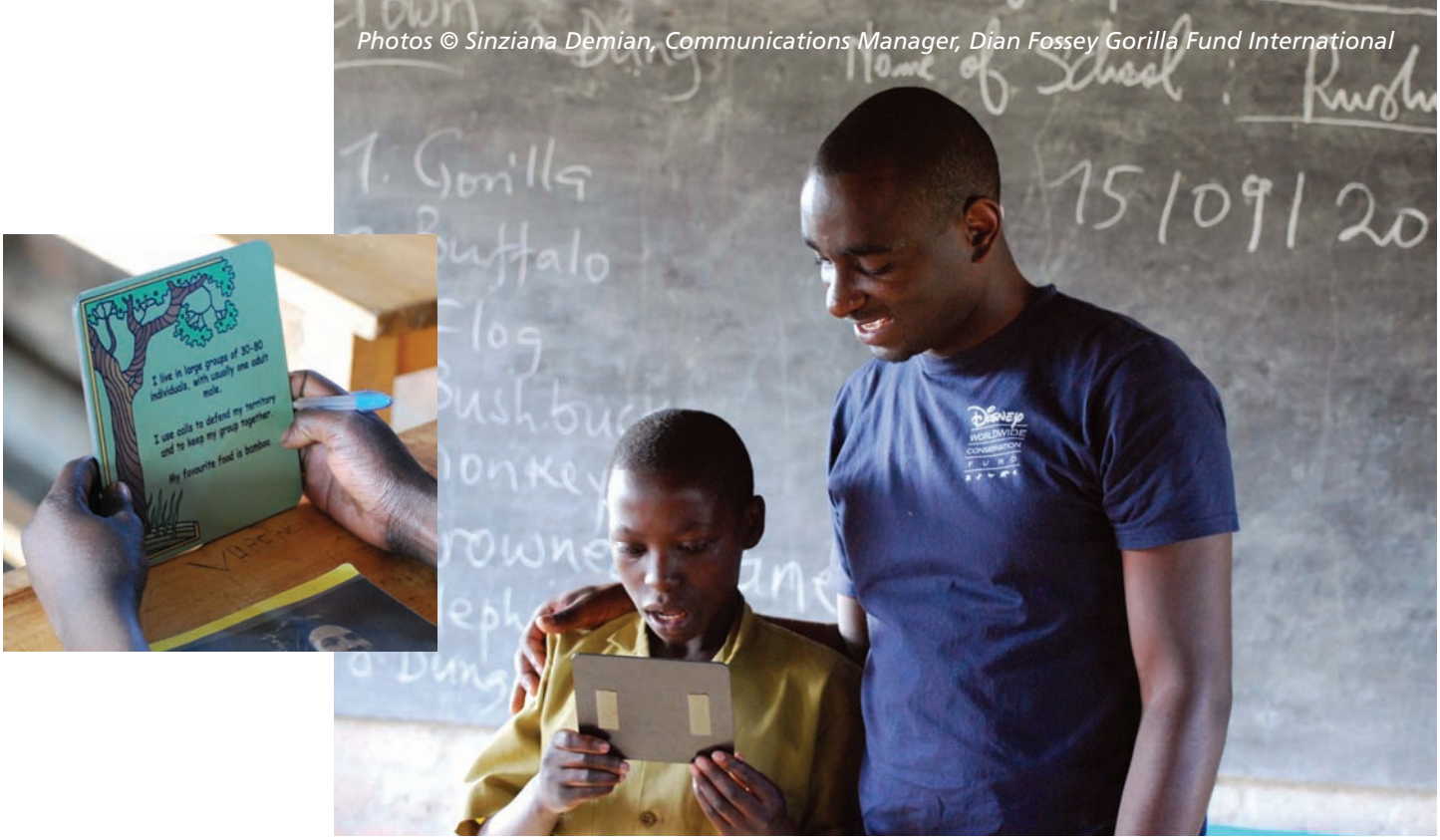

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Disney's Animal Kingdom® and the Dian Fossey Gorilla Fund International have teamed up to teach students in Rwanda about the animals living around them and why they need our help to survive.

Conservation education is the process of engaging people and positively influencing their knowledge, attitudes and behaviors about wildlife and wild places. Disney's Animal Kingdom® and other conservation-minded organizations across the world, including the Dian Fossey Gorilla Fund International (DFGFI) in Rwanda, strive to build awareness of the vital connection between humans and nature. This relationship between human survival and nature bears a distinctive characteristic: the more difficult human livelihood (survival) is, the more likely that the humans will turn to nature, compromising its integrity in the process. This explains why it is critical that the human populations living in closest proximity with 'nature' (near natural reserves) understand and value this connection.

Volcanoes National Park (Rwanda), Virunga National Park (Democratic Republic of the Congo) and Bwindi Impenetrable National Park (Uganda) make up the Virunga Massive Mountain Range, famous for being the only habitat of the mountain gorilla. Rwanda already has the highest population density in Africa (exceeding 500 people per km^2), but the figure reaches an astonishing 1,028 people per km^2 in some sectors near Volcanoes National Park (Bush *et al*., 2009), making it worthy of intensive conservation focus. This high population density is translated on the ground as a strong pressure of anthropogenic activities, such as an increase in demand of forest resources (bamboo cutting for building and crafts making, firewood and water, hunting for meat, medicinal plants, etc.) and human-animal conflict mainly due to crop raiding. Making matters worse is the lack of education on the part of the communities living near the park, which leads to a lack of appreciation for the true value of the forest that is the park. What locals know is that the forest has the gorillas that attract tourists who bring money, but that money goes to the government. Locals see no direct benefits to themselves, especially since their crops are raided by buffaloes and monkeys and they receive no governmental compensation (Sabuhoro, 2007) for the damages. This situation calls for an innovative conservation education strategy that appeals to people's sense of goodwill and responsibility to understand the magnitude of what is at stake.

At Volcanoes National Park, students learn about gorillas and other animals right in their natural habitats.

In 2009, the DFGFI collaborated with educators from Disney's Animal Kingdom® to develop a conservation education program that targets children within schools around the park. The mission of these programs is to nurture a generation of children who understand the critical link between humans and nature and are therefore more willing to care for wildlife and natural ecosystems such as the Virungas and the gorillas who call the park home. The program was based on a model that had been implemented and received positive evaluation for the promotion of awareness of threats to chimpanzees in Uganda. The program aims to address the information gaps on:

(a) the importance of conserving the forest and its biodiversity (how animals depend on the forest to survive and vice versa)
(b) the dependence of human livelihoods on a healthy ecosystem (ecosystem services)
(c) the human threats to the forest and its biodiversity and
(d) the actions that we all can take to mitigate the negative human impact

Methods and Content

Two curricula were developed: one for Primary 3 and one for Primary 5 children. Primary 3, ages 8-9 represents the really young children with little or no notion of ecology and environmental issues. Primary 5, ages 11-12, comprises relatively older children who have started learning about ecology and the environment in other subjects such as "Elementary Science and Technology".

In the Primary 3 curriculum, children are introduced to different animal species in the forest/park. They learn about what these animals need in order to survive and the difficulties they face. They also participate in guided nature walks around the school and nearby environs and are taken through a list of possible actions they can take to conserve forest habitats. All the while, emphasis is on delivering interactive lessons that allows for participation and self-discovery. It also provides a better understanding and retention of the content and messages. In the Primary 5 curriculum, more information is given on how different animal species benefit the forest and vice versa, and the

children are called upon to learn more about the diverse wildlife in the forest through participating in a guided forest walk to allow them to experience the amazing forest habitat of the animals. There is also a broader discussion of threats to wildlife and what the children can do to help. In both the P3 and P5 curricula, it is emphasized that children have the responsibility to help protect wildlife. There's also frequent use of visual aids and fun games to hold the students' attention and allow them to learn in different ways.

A typical Primary 3 class in this area has about 300 children, and Primary 5 has about 200. The children are divided into groups so that a teacher instructs 40 children at a time. To deliver the conservation education program, the DFGFI conservation education officer visits schools and delivers lessons with each 40-student group in Primary 3 and Primary 5. Training on how to teach these programs was provided by a workshop through Disney's Animal Kingdom®. Each class lasted an hour-and-a-half and included a pre- and post-lesson conservation knowledge survey, as well as lessons conducted inside and a nature walk around the school grounds.

Evaluation and Results

There is increasing consensus that any conservation effort, including conservation education, requires evaluation to determine whether it is positively contributing to conservation efforts. As Ferraro and Pattanayak (2006) in Kuhar *et al*. (2010) argue, evaluation data not only influences funding, but can also influence public policy. According to Bettinger *et al*. (2010), the true effectiveness of a conservation initiative may not be measurable for many years, but there are short range techniques of assessing certain components of the work, such as (1) is your audience receiving the intended message, (2) does the message change their attitudes towards the environment and (3) does your audience understand what they can do to help conservation.

Through the DFGRI program, students are taught that we are all responsible for protecting nature.

Both the Primary 3 and Primary 5 students were asked to answer questions prior to the lessons, and the same questions were asked again after the conservation education lessons to assess knowledge gained as a result of participating in the program. The evaluation of the first two years of implementing these conservation education curricula shows a general increase in knowledge as result of participation, and demonstrates the need to continue to expand and to refine the program in order to successfully engage the students.

In the Primary 3 program for example, over the two years of implementation there was an average increase of 13% of students per class who correctly identified the survival needs of animals, as well as what they could do in order to help wildlife conservation after participation. However, another question asking the students whose responsibility it is to protect the forest produced rather surprising results. In 2009, the number of students who gave the correct response ("it is my responsibility"), and those who responded incorrectly after participation was even. A closer look at why (by interviewing some of the students that had chosen the incorrect answer)

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The success of an educational program, it can be argued, depends on the effectiveness of its delivery and that in turn depends on the training of those delivering it.

revealed that many children confused the image of the building (one of the multi-choice images that were used to make it easy for this young audience to participate) to mean a classroom, which the children identified with, and since they had been taught that it is their responsibility, they chose the 'classroom' (building). In the following year (2010), the image was not changed but emphasis was put on explaining the images and the post-evaluation for the same question revealed a 24% increase in the correct response. Perhaps changing the image to make it clearer would improve comprehension even more.

In the Primary 5 program, over the two years most students (97%) were able name two animals that live in the forest (not necessarily from the Volcanoes National Park) even before participating in the program. This shows that this question is perhaps too easy at this level and moving forward we will change it and ask them to name two animals that live in Volcanoes National Park.

Another question testing the knowledge of environmental problems facing the forest increased significantly (36%) between pre- and post-tests in 2009, but in 2010, the increase was only a modest 6%. This was the same for the question on how they can help (30% knowledge increase in 2009 compared to only 9% in 2010). A possible explanation would be the quality of delivery of the lessons. While the entire 2009 program was delivered by a person trained by Disney's Animal Kingdom® staff, in 2010 this person trained and was helped by two assistants in order to cover more schools (three schools and 745 children in 2009; four schools and 1,378 children in 2010). Therefore, while coverage of the program almost doubled, the level of comprehension seems to have been negatively affected.

Recommendations

Bettinger *et al*. (2010) argue that the success of an educational program depends on the effectiveness of its delivery and that in turn depends on the training of those delivering it. Innovative teaching that employs hands-on materials and interactive techniques requires adequate training which up until now has been afforded only to one person, the DFGFI education officer. However, given the need to expand and reach out to more children, it is important that more people get the training to effectively deliver the programs. One way to achieve that would be to hold workshops and train local teachers in how to use the teaching materials to interactively deliver conservation education lessons. This would involve additional costs to duplicate the teaching materials but it would be a valuable investment because it will ensure that the program reaches more children in a timely manner, and will provide teachers with examples of innovative interactive lesson plans that can be applied in other areas. Such an approach would also ensure that the teachers provide sustainable support to behavior change and adaptations by students as a result of participating in the program, something the teachers have not been doing perhaps because they regarded the whole program as something being promoted from outside.

The evaluation also demonstrated a large gap in ecological knowledge on the part of the students. The results showed, for example, that not only did the students have low prior knowledge of environmental problems (45% in 2010) but that the increase was minimal even after participation (51%). Although the increase after participation was better in 2009 (from 40%-76%), it should be noted that prior knowledge on this question was clearly low for both years (40% and 45% in 2009 and 2010 respectively). This statistic and other interactions during the course of delivering the program showed the students lacked knowledge of basic ecological principles such as the interconnections between different elements of the ecosystem. It is important to take all necessary measures to boost this critical aspect of science education at this formative stage for the children if we want a future generation that cares to maintain healthy ecosystems and a healthy planet.

One recommended way of supplementing the national education curriculum in the realm of conservation education would be the introduction of conservation storybooks and posters (Dolins *et al*., 2010). By creating age-appropriate storybooks and posters, with interesting, informative and colorful pictures, students can learn about the flora and fauna of Rwanda, about the habitats, ecosystems and ecosystem services, and how we all (humans, plants and animals) are linked together in a single web of life.

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