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Primates as Flagships for Conserving Biodiversity and Parks in Indonesia: Lessons Learned from West Java and North Sumatra

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Abstract: Conservation International's Indonesia field program has carried out three conservation awareness programs; two are still running, while one was discontinued due to lack of funding. These conservation education programs are part of a long-term plan to prioritize large-scale efforts to conserve biodiversity in Indonesia by pulling together various stakeholders and partners. Environmental education programs can be sustained through partnerships with local NGOs, the government, universities, the private sector and donors. Successes with regard to the conservation of flagship species have been notable in some areas. The Bodogol Conservation Education Center, for example, has focused on the Javan gibbon (*Hylobates moloch*) and the Javan eagle (*Nisaetus bartelsi*), while the Sumatran orangutan (*Pongo abelii*) was used as a flagship species in the education programs at the Sibolangit Interpretive Center. Discontinuation of the Sibolangit Interpretive Center occurred due to a lack of donor support, as has been the case for many conservation education programs in Indonesia. Nationwide, few public awareness programs that focus on species have survived and been proven effective without relying on donors. A key to the success of the surviving programs is engagement with a variety of partners that provide diverse skills, funding opportunities, and resources.

Keywords: Awareness programs, conserving biodiversity and parks, Indonesia, primates

Introduction

Historically, conservation awareness has mostly been embedded in environmental education at the primary, secondary and tertiary levels of the formal education system, and in extra-curricular activities for children and adult education programs. These activities use any type of education material about nature, wildlife and the environment with the underlying goal of achieving an appreciation for and understanding of nature, with participation in activities related to its protection. The aim of these programs is to increase awareness and alter behavior to contribute to conservation and decrease environmental destruction resulting from human practices. Brown (1988) believes that only a handful of concerned scientists and environmentalists are actively engaged in the race to preserve our plant and animal life, and if he is right, we need to increase the number of people expressing concern and working on this issue. Although conservation education will not solve all environmental problems alone, effective education and communication programs are a prerequisite for better natural resource management and, ultimately, for safeguarding the biosphere on which we all depend (Jacobson 1995).

Indonesian environmental education programs began in the late 1960s, mostly in schools, and gained momentum when the Government of Indonesia established the Ministry of the Environment in the early 1970s. Initiatives to educate Indonesians about the environment have mostly focused on curricula, biology books and related activities, such as nature clubs, at a number of universities. Non-governmental organizations (NGOs) have played a significant role, either by developing conservation centers in or near parks or by proactively working with schools to develop the necessary biodiversity conservation content for their curricula (Indrawan *et al.* 2007; Supriatna 2008).

Although public environmental education is not a new idea, it has previously only had a small-scale and short-term impact in Indonesia. The oldest environmental education facility is the Seloliman Forest Center in East Java, which brings together students, educators, farmers, governments, businesses, women's groups and the general public to learn

about the environment. Courses at Seloliman have included seminars to promote the integration of environmental education into school curricula and workshops for local villagers to learn skills for environmentally friendly living. This center is the oldest in Indonesia and has received many awards for successfully educating a wide range of stakeholders in environmental issues.

In 1995, World Wildlife Fund Indonesia created an environmental awareness program that departed from other initiatives of this sort with a special project that included cars equipped with films, and flyers for the school children, communities and stakeholders in forested areas, such as national parks and other protected areas (WWF 2014). Conservation International (CI) initiated similar programs in three locations in the early 1990s. The first was in the Gunung Gede Pangrango National Park (GGPNP**)** near Bogor, West Java, which is south of Jakarta, the capital city of Indonesia. The second was the Sibolangit Interpretive Center, established in North Sumatra Province as an anchor for conserving parks and biodiversity over large areas, such as the Leuser Ecosystem (2.3 million ha). The third program was located in the marine and coastal areas of Raja Ampat in West Papua. This program continues to this day and uses a large ship called "Kalabia," which means "shark" in the local language, as a mobile classroom.

In this paper, we review two conservation awareness initiatives of Conservation International that have focused on educating the communities living in forested areas around parks. Both used wildlife species as flagships: Bodogol in GGPNP in West Java; and the Sibolangit Interpretive Center in the Sibolangit Nature Reserve of North Sumatra. Both were successful for a while, but only Bodogol in south-west Java continues today. We describe the development and activities of these programs and draw lessons for future environmental education and awareness programs in Indonesia.

Bodogol Conservation Awareness Program at GGPNP

GGPNP, in West Java, was established in 1980. It was one of the first national parks in Indonesia and declared one of its six UNESCO Biosphere Reserves (Wardojo 1997). GGPNP is a 21,975-ha montane forest located around Jakarta, Bogor and Bandung in West Java, the most densely populated part of Indonesia—approximately 35 million people live around the park. The park is a 90-minute drive from Jakarta, and provides critical habitat for the endemic and Critically Endangered Javan eagle (*Nisaetus bartelsi*), the Javan grizzled leaf monkey (*Presbytis comata*), the Javan gibbon (*Hylobates moloch*) and the Javan leopard (*Panthera pardus melas*) (Supriatna 2006).

The park lies at the core of a 100,000-ha water catchment that includes the neighboring mountains of Halimun and Salak. The value of the water in this region is approximately US$100 million/year after it is collected and sold for the consumption of approximately 20 million people in 144 villages and five nearby cities, including Jakarta (Conservation International Indonesia 2009).

Since 1994, the national park, with the aid of CI, has been developing a consortium to promote a collaborative approach toward biodiversity conservation, education and awareness. The principal agencies are CI, the Agency for Forest Protection and Nature Conservation (PHKA) that is the part of the Ministry of Forestry that oversees the GGPNP, and the Alam Mitra Indonesia Foundation (ALAMI). The consortium also includes the University of Indonesia, the private sector, the local government, and local communities. The University of Indonesia established a research station adjacent to the conservation education facilities. Easy highway access from three major cities: Jakarta, Bogor, and Bandung make this the most frequently visited national park in Indonesia. The education center is located on the slopes of Mt Pangrango, approximately 800 m above sea level, and provides a cool and comfortable retreat from the hot, humid environment of the lower surrounding areas.

The numerous partners in the consortium have worked together to establish a range of programs to safeguard the ecosystems of the park. Major accomplishments have been the establishment of a biodiversity conservation education center, the university research station, and the Javan Gibbon Rehabilitation Center. Since 1998, the consortium members have been developing and implementing the awareness and education program as one of their conservation tools. The program set up a separate entrance from the main gate to the GGPNP to facilitate access to visitors interested in nature education. This entrance is closer to Jakarta than is the main gate and allows visitors to avoid the weekend traffic congestion found in the park. The facilities at this alternative gateway promote experiential education and allow visitors to spend several days in the center.

The alternative, informal education program at the Bodogol Conservation Education Center was designed to provide target groups with the opportunity to explore and directly experience the tropical rainforest and its surroundings. The theme of the program is "Revealing the Secrets of the Rainforest," and the educational content is classified under various topics, including "The Forest, the Food Supplier," "The Forest, the Drug Store," and "Life under a Canopy." The conservation education and awareness program has been designed to match the varied characteristics of the visitor groups, with an emphasis on providing first-hand experience exploring the tropical rainforest. The methods used to deliver the information on nature conservation issues are set up to be fun and interactive, to encourage curiosity and creativity, as well as positive and active participation.

The program also targets women, especially those living in the park or its surrounding areas, as well as members of government, particularly the staff of the Ministry of Forestry and Regional Planning. Training courses for teachers, local rangers, and government officials are held at the park. The education program also targets children from the surrounding urban and rural areas through the Nature Kid Program, and

conservation students and scientific professionals, and other interested members of the public and Indonesian business executives.

Most activities (75%) are conducted outdoors and focus on providing visitors with a first-hand experience of nature using their senses. Guided classroom activities also make up a part of the program. Other sessions (25%) are focused on introducing visitors to the forest and providing them with information about life in the forest. The outdoor activities primarily involve guided walks (including crossing a canopy walkway), nature games, and discussions. Participants are divided into small groups, usually with a maximum of six people, and are accompanied by a facilitator.

This national park is among the most frequently visited in Indonesia. Overall, 35% of the visitors are students but, from 1998 to 2013, students comprised 66.5% of the visitors to the Bodogol Conservation Education and Awareness Center (Fig. 1). During this time, more than 50,000 people visited the center, including local school children, families, community groups, decision makers and corporate executives. Overall, the hope is that students will increase their curiosity and enhance their sense of biophilia.

The facilities that have been established since 1998 include a 100-m canopy bridge and walkway, one classroom, two furnished dormitories of 40 bunk beds each, a kitchen and restaurant, a gazebo, a park guide house, a volunteer house, display rooms and 2 km of forest tracks with scenic outlooks that include information on the park's biodiversity, ecosystems, and topography, and records their distance from the main gate (Figs. 2–5).

The Center also offers guided nature walks, lectures and training courses. A modest research center provides laboratory space and accommodations for visiting researchers at the following costs: one-day visit (including a program +

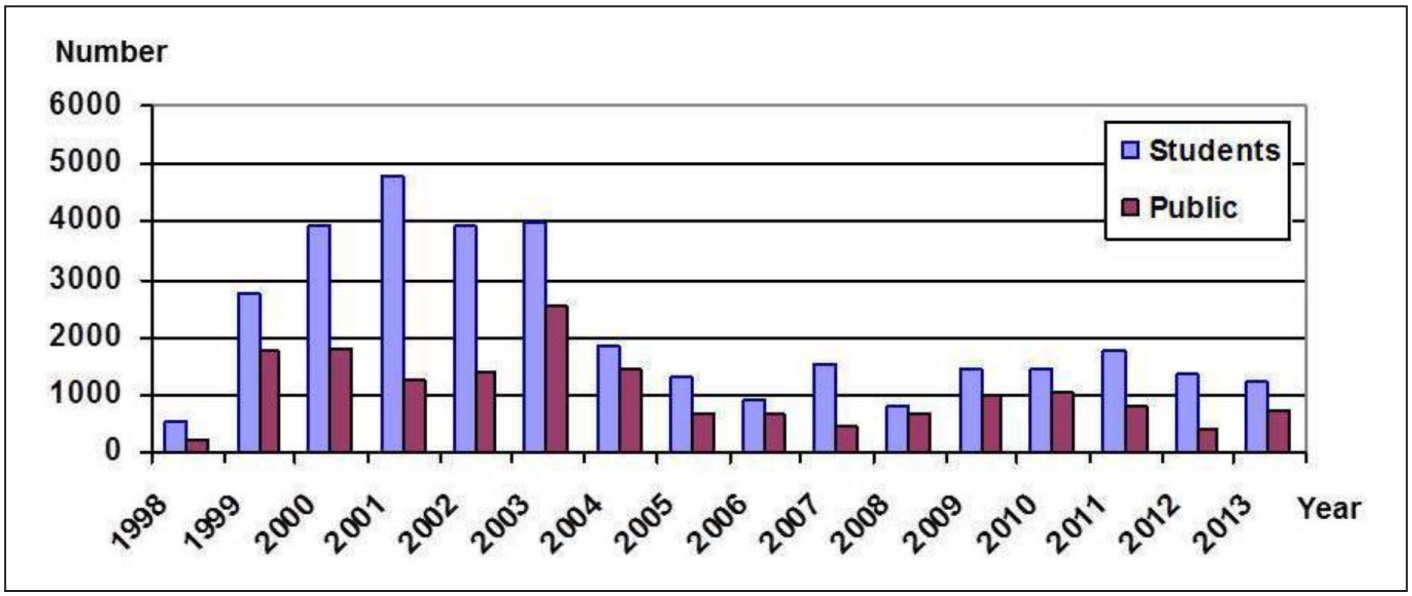

Figure 1. Number of visitors at the Bodogol Conservation Education Center each year.

Figures 2 and 3. The Bodogol Conservation Education Center (Photos © Conservation International).

ticket + insurance + guide + welcome drink) plus the canopy bridge or the Cikaweni waterfall (3–4 hours) for $3.5 (general public) or $2.5 (student), and for both the canopy bridge and the Cikaweni waterfall (4−6 hours) for $5 (public) or $3 (student). The Adventure + the canopy bridge (4–6 hours) costs approximately $5 (public) or $3.5 (student), while visiting the Cipadaranten waterfall (6–7 hours for a minimum of 5 people) costs $6 (public) or $4 (student).

There are also several packages for multiple-day visits that include program fees, tickets, insurance, interpreters, accommodation, welcome drinks, meals, and transportation. Costs range from $20 to $50 for one person for research tourism, family gatherings, backcountry fun, family camping, and other packages. The programs also provide benefits for the communities around the park, such as employment for field staff and interpreters and income from meal provision, local motorcycle transportation (*ojek*) and jeep rental.

From 2003 to 2007, with support from the Ford Motor Company in Jakarta, the consortium ran a mobile unit that visited hundreds of schools and thousands of students surrounding the park. The car was called "Molly and Telsi" and symbolized two flagship animals; Molly, a Javan gibbon (*Hylobates moloch*), and Telsi, a Javan eagle (*Nisaetus bartelsi*). The car was equipped to show documentary movies and host a talk show for school children and people in the villages (Figs. 6 and 7). More than 40,000 people were visited using this unit.

Sibolangit Interpretive Center, North Sumatra

From 2001–2004, with funding from the Critical Ecosystem Partnership Fund (CEPF) and in partnership with the local office of the Ministry of Forestry, CI developed the Sibolangit Interpretive Center, located approximately a 1-hour drive from Medan toward Berastagi. The Center used the Sumatran orangutan (*Pongo abelii*) as its "flagship" species to increase public awareness about natural resource management and biodiversity conservation (Figs. 8 and 9). The Center was situated on the main road between Medan and Lake Toba in central North Sumatra near a large lake formed by the eruption of a super volcano. It focused on conservation education

Figures 4 and 5. Activities at the Bodogol Conservation Education Center (Photos © Conservation International).

Figures 6 and 7. The vehicle used to visit villages and schools (Photos © Conservation International).

and raising public awareness in the communities surrounding Gunung Leuser National Park (Perbatakusuma *et al.* 2009).

The center's staff were supported by volunteers from the surrounding communities, all of whom had undergone intensive training in nature interpretation. To reach audiences that otherwise might not have had the opportunity to learn about orangutan conservation, CI also operated the Orangutan Mobile Education Unit, which took the conservation message beyond the gates of Sibolangit to remote areas. These areas included villages of refugees from the Aceh Tsunami of December 2004 that had been created within the National Park (the second phase of program development; see Table 1).

Additional funding from USAID and a private donor was secured from 2005–2007 that allowed the Mobile Unit to expand its coverage to West Batang Toru. The Mobile Unit travelled to remote villages and camped out for 3–4 days at a time with regular return visits throughout the year. During visits, the CI team conducted informal learning sessions that ranged from school visits and puppet shows to interactive games and daytime forest walks. The Mobile Unit was warmly received by local communities and was very effective in raising awareness among its target audiences. It reached villages and refugee camps in regencies in North Sumatra, and hundreds of people attended each session, particularly a popular, evening "orangutan film series" (Figs. 10 and 11).

The Mobile Education Unit was an integral part of the conservation education work in North Sumatra, and it also provided an important entry point for reaching local decision makers. Interpreters play a very important role in conservation education throughout the world, and through them, the public comes to understand nature and its role in supporting their livelihoods. Interpreters have the skill to communicate and translate the technical facets of the environment and its interactions in non-scientific terms in a clear and comprehensible manner. Good interpreters are as such a key component of successful conservation education programs. The training materials for interpreters include the basics of ecology for nature guides or interpreters, conservation games, the basics of nature interpretation, communication for nature guides and interpreters, the identification of the flora and fauna, jungle survival, and practice in the field.

Figures 8 and 9. Activities at the Sibolangit Interpretive Education Center (Photos © Conservation International).

Figures 10 and 11. Vehicles used to visit villages and schools (Photos © Conservation International).

As part of developing the education and awareness program, CI assessed the level of knowledge about orangutan conservation in the area surrounding Gunung Leuser National Park. Surveys were undertaken to evaluate the knowledge level, attitudes, and behaviors of the community to provide a foundation for developing a targeted campaign strategy. The surveys were conducted in three sub-districts (Bohorok, Sibolangit, and Tiga Lingga) that border or are near to orangutan habitats. The total number of respondents was 360 people, 48 of whom were the formal and informal leaders of their communities. Another assessment was specifically designed to evaluate the knowledge, attitudes, and behaviors of the decision makers (Perbatakusuma *et al*. 2009).

The survey results suggested that the communities in the sub-district of Tiga Lingga had the lowest level of knowledge about forests, orangutans, and the relationship between the two. In most of the study areas, the decline in clean water (both availability and quality) was the most important concern for the people interviewed. Most of the respondents identified their immediate welfare as their first priority, with forest destruction as a lesser concern.

Based on the responses from the target groups, three categories of educational activities were developed. The first specifically targeted adult members of the general public, including the refugees in the park. It included the creation of illustrated informational materials in the form of fact sheets and posters, the production of sermon sheets, the development of information boards for the local café, and movie sessions and discussions. The sermon sheets were pages with information on the environment and biodiversity conservation, which were developed by the programs in collaboration with the priests, and were to be given during Sunday prayer. In addition, the awareness center and the mobile unit staff also collaborated with partners to produce and distribute additional materials, such as Video News Releases (VNR), posters, t-shirts and a variety of souvenirs.

The second category specifically targeted decision makers, and included a series of meetings and visits. The targeted decision makers included the heads of local governments, members of parliament, forestry officials and members of other institutions bordering the orangutan habitats.

Table 1. Comparison of the two conservation education programs initiated by Conservation International in Indonesia.

Products	**Bodogol**	**Sibolangit**
Location	Gunung Gede Pangrango National Park	Sibolangit Tourism park, Leuser National Park
Target audiences	Communities around the park, visiting students, paying visitors, family gatherings, and people from the cities of Bogor, Sukabumi, Bandung, and Jakarta (the capital city of Indonesia)	Communities around the park and students from Sibolangit and Medan (the capital of North Sumatra)
Partner organizations	The national park, CI, local NGOs, the private sector	The Conservation Office (BKSDA), CI, local NGOs, USAID
Outreach	Both at the education center and through communities surrounding the park	Through the interpretative center and villagers around the orangutan habitat, a radio talk show series discussing conservation and other related topics, radio spots and public service announcements about conservation
Flagship species	Javan gibbon and Javan eagle	Sumatran orangutan
Equipment	Digital film documentation and work with Muslim boarding school leaders	Digital and film documentation and work with church leaders
Infrastructure/ vehicles	In the park: Bodogol Conservation Education Center (2 rooms with 40 bunk beds, 1 class room, 1 volunteer house, 1 staff house, guard house, 2 gazebos, 1 restaurant, 1 canopy bridge, and 2 km of trails) Outside the park: travel from school to school around the park, including the Islamic boarding school, villages, etc., in an SUV donated by Ford Motor Company	In the park: Sibolangit Interpretive Center (1 office house, 1.5 km of trails, and several gazebos) Outside the park: travel in an SUV to visit villages, schools, churches and mosques
Funding	Collaborative partnerships (park budget, local and international companies, ticket sales, and program packages), the Keidaren Foundation from Japan, Mattel, and entrance fees and program packages	CEPF (Critical Ecosystem Partnership Fund) and USAID
Educators	CI staff, in collaboration with the University of Indonesia, volunteers from NGOs and the park authorities, developed education modules, flyers and digital information	CI staff and, occasionally, park rangers
Duration	1998 to present	2001–2007
Tag lines or Programs	“Reveal the Secrets of the Rainforest,” “The Forest, the Food Supplier,” “The Forest, the Drug Store,” and “Life under a Canopy”	“Save the Orangutan”

Lessons Learned from Conservation Education and Awareness Programs

The CI Indonesia conservation education and awareness programs are summarized in Table 1. The two programs have many similarities in terms of their backgrounds, aims and methods. Both successfully used flagship species to reach larger audiences and attract more donors. Only the funding models differed.

The Bodogol Conservation Education and Awareness Center has successfully moved towards financial sustainability, except for the mobile unit that educated school children. This latter program has now been terminated due to insufficient funds for its operation and maintenance (Fig. 12).

The Sibolangit Center, which depended on donors rather than income from visitors and participants in its programs, was terminated in 2007 after CI handed it over to a local NGO. Unfortunately, the local NGO was unable to raise enough funding to sustain the education program.

From our review of these two programs, it seems that increasing public awareness of the important environmental services (for example, watershed protection and erosion control) provided by forests was a key component in stopping or slowing illegal logging and, ultimately, conserving orangutans and the Javan gibbon. Most of the programs offered by both centers promoted the idea of ecosystem services. In addition, appreciating how the survival of orangutans in Sumatra and of Javan gibbons and Javan eagles in Java are linked to the forests in which they live enabled communities and decision makers to understand the importance of reducing further habitat loss through the cessation of logging and/or the restoration of habitat, as well as by providing alternative livelihood opportunities for local communities.

A number of educational methods were used, including fact sheets, posters, displays, and power point presentations, along with several editions of sermon sheets to promote the importance of protecting species and nature from the perspectives of both Islam and Christianity. All of these awareness activities were preceded by an awareness needs assessment of the general public (including refugees in the case of Sumatra) and key decision makers.

Why were flagship species used? These species act as an umbrella for all other forest species. In Sumatra, many communities already knew that the habitat of the Sumatran orangutan had decreased rapidly due to habitat conversion for commercial and subsistence agriculture, logging, open-pit mining, forest fires, infrastructure development, local encroachment and many other factors. Sumatran forests are undergoing the highest rate of conversion in the world (Supriatna *et al.* 2002; Wich *et al.* 2008; Singleton *et al.* 2009), causing a loss of orangutan habitat.

The story of the Javan gibbon and Javan eagle is different. Habitat has certainly been lost for the same reasons as in Sumatra, but, currently, the main culprits threatening these species are the poachers taking their young to be sold as pets. Populations of both species have decreased significantly in the wild with no more than 5,000 individuals of the Javan gibbon (Supriatna 2006; Supriatna *et al.* 2010) and only a few hundred Javan eagles (Whitten and Soeriaatmadja 1999) remaining.

Mangunjaya (2002) recorded that the perceptions of biodiversity among middle school students around the Gunung Gede and Gunung Pangrango national parks changed after some of them had been visited by the mobile unit team. The perceptions of the significance of biodiversity among the students could be broken down into the following categories: esthetic (27%), moralistic (22%), humanistic (19%), scientific (13%), naturalistic (6%), utilitarian (4%), dominionistic (3%) and symbolistic (2%). The high scores for esthetic, moralistic and humanistic values reflect certain societal values. The esthetic value indicated an attraction to the beauty, equality, symmetry and love of nature, while the moralistic value shows a spiritual closeness with nature, indicating that people feel a need to protect and understand it (Kellert 2002).

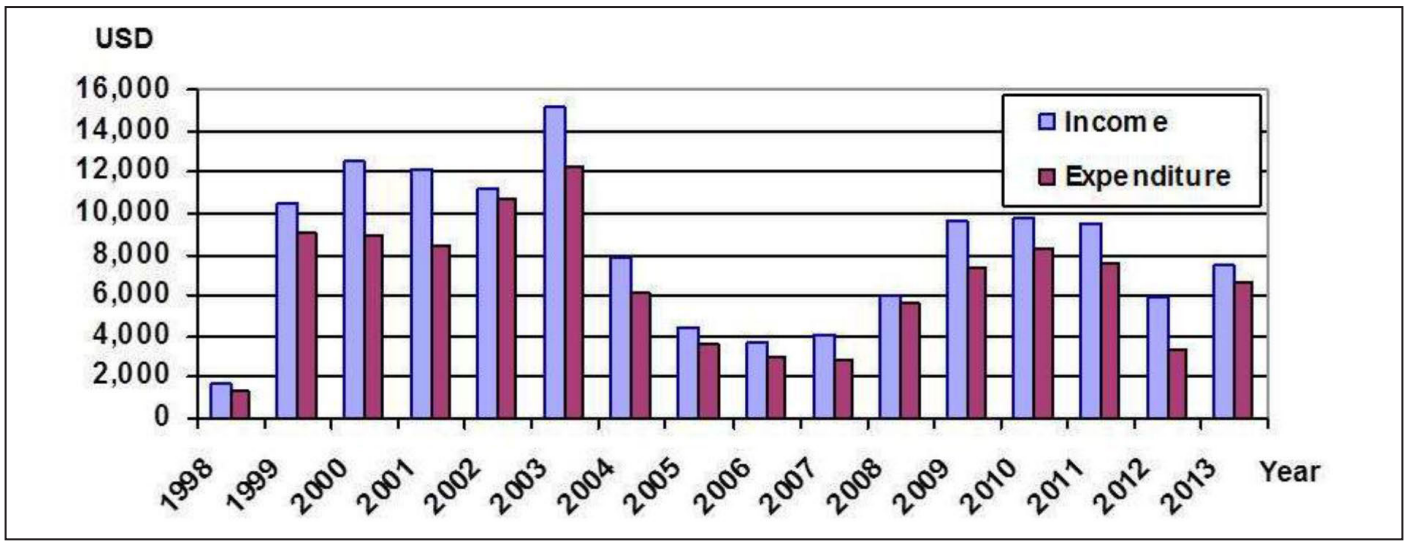

Figure 12. Income and expenditures at the Bodogol Conservation Education Center each year.

Marketing strategies, such as mass media advertising, are also extremely effective at raising public awareness and disseminating at least a small set of important facts to many people at a relatively small investment per person. Although mass media advertising campaigns can never replace an educational curriculum, they can target other important audiences and affect decision makers and other community leaders by raising awareness of issues that would otherwise not be as widely recognized. Many donors have improved protected area conservation efforts by promoting pride in endemic Indonesian biodiversity and concern over its future (Supriatna 2008).

Discussion

Ultimately, efforts to conserve biodiversity must succeed at the community level, which is where the ultimate measure of the effectiveness of conservation efforts will be felt. Alliances between civil society, communities, the private sector, and government are powerful tools to create support for environmental education and understanding. Creating alliances requires building awareness and creating incentives for people to support conservation efforts. The creation of these alliances and the dissemination of information to residents living near parks, decision makers, and participating communities have been used by CI in Indonesia in the two examples reviewed here. These conservation education programs have been successful in helping people understand the importance of ecosystems, the species in them, and their fundamental role in supporting livelihoods in West Java and North Sumatra. Public interest in the wildlife, especially charismatic species, such as orangutans and gibbons, among the villagers surrounding the parks is historically high, and has recently been reinforced by several animal programs on television.

Conservation education and awareness focused on flagship species is not new, but combining this strategy with a range of tools, as in these two examples, has been largely successful. In the case of the Bodogol Conservation Education and Awareness Center, this approach has resulted in a sustainable financing mechanism. The different models show that conservation education will ultimately be successful only if it is supported, now and in the future, with sufficient funding, either through donations or through a financial model that raises funds from visitors and ecotourists, or a combination of both.

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