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'Why must we protect crocodiles?' Explaining the value of the Philippine crocodile to rural communities

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What are valid arguments to protect the Philippine crocodile in the wild? And how are we to explain the normative foundations of biodiversity conservation to rural communities in the developing world? Conservationists mainly rely on economic values to justify in situ wildlife conservation. In this article, we argue that these utilitarian reasons are often based on inaccuracies and flawed assumptions. By focusing narrowly on economic incentives, conservationists risk undermining their credibility and obscuring other valid reasons to protect nature. Cultural and intrinsic values can also form a strong motivation for poor people in non-western societies to conserve biodiversity. In the northern Sierra Madre on Luzon, respect for nature, interest in wildlife ecology and pride in the occurrence and conservation of a rare and iconic species proved to be effective incentives to protect the Philippine crocodile.

Keywords: conservation ethics; communication; intrinsic values; sustainable use; environmental education; crocodile; Philippines

1. Introduction

In May 2008 we organized a community consultation in Lumalug, a small village in the northern Sierra Madre mountain range on Luzon, to present a plan to declare the small stream that runs through the village as a protected area. Dinang Creek harbours the largest reproducing Philippine crocodile population remaining in the wild. We explained to the villagers that the Philippine crocodile is protected by law and solicited people's support for the preservation of the species. But then a farmer stepped forward and asked a simple, straightforward question: "why?" We did not have a good answer.

Why must we protect crocodiles? Perhaps surprisingly, conservationists are ill equipped to address this fundamental question (Barry and Oelschlaeger 1996; Van Houtan 2006). Too often arguments to conserve wildlife lack a scientific basis, or are irrelevant from a local perspective. This is particularly problematic in developing

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countries such as the Philippines, where rural poverty, weak governance, cultural differences and scarce financial resources hamper conservation efforts on the ground. In such a context, communicating a sound normative foundation for nature conservation forms a major challenge (Berkes 2004).

The Philippine crocodile (*Crocodylus mindorensis*) is classified as *critically endangered* on the IUCN Red List of Threatened Species (IUCN 2010). In theory the endemic species is protected by Philippine law (by virtue of the Wildlife Act of 2004) but in practice the Department of Environment and Natural Resources (DENR), the mandated government agency to protect wildlife, lacks the capacity and legitimacy to enforce environmental legislation (van der Ploeg and van Weerd 2004). Most people in the Philippines see crocodiles as a threat to livestock and children and are unaware of legislation protecting the species in the wild (Banks 2005). Hunting, the use of destructive fishing methods and the conversion of freshwater habitat continue to threaten the remnant crocodile populations in the archipelago (van Weerd and van der Ploeg 2003).

Over the past 10 years we have been involved in a conservation project for the Philippine crocodile in the northern Sierra Madre. In 2003 we founded the Mabuwaya Foundation, a small non-profit organization dedicated to the conservation of the species in its freshwater habitat. In cooperation with Isabela State University, the foundation disseminates information on the ecology and conservation of the species to people living in crocodile habitats. As a result, most people living in Philippine crocodile habitats now know that the species is legally protected, and crocodiles are no longer deliberately killed (van der Ploeg et al. 2011b). But farmers and fishers often do not understand *why* it is important to preserve the Philippine crocodile in the wild.

In theory, there are several reasons to conserve nature. Environmental philosophers differentiate between instrumental and intrinsic values (Passmore 1980; Rolston III 1988). Instrumental values emphasize the importance of biodiversity to human societies. Most often this takes the form of economic values such as monetary benefits derived from the sale of crocodile leather, or of environmental services such as eating fish caught from the wild, drinking clean water or preventing erosion (Balmford et al. 2002; Millennium Ecosystem Assessment 2005). Some scholars stress the cultural importance of nature, which includes aesthetic, recreational, spiritual, scientific and psychological values (Ratcliffe 1976; Wilson 1992). Intrinsic values in contrast emphasize the value of species as *ends-in-themselves* regardless of whether they are also useful to mankind.

In practice, however, conservationists tend to focus on economic values to justify conservation policies (Infield 2001; McCauley 2006). Especially in developing countries, market-based approaches to protect nature and alleviate poverty appear attractive to mobilize local support. Aesthetic and moral concerns are often dismissed as romantic western constructs that have little practical value for impoverished communities in the Third World. In a comment in the scientific journal *Nature* Eric Meijaard and Douglas Sheil (2008: 159), for example, stated that "cuddly animals don't persuade poor people to back conservation."

In this article, we argue that utilitarian arguments to convince rural communities to protect the Philippine crocodile in the wild are often oversimplified, inaccurate or irrelevant from a local perspective. By using these flawed arguments, conservationists risk losing credibility and alienating local people from nature conservation.

Intrinsic and cultural values such as pride, love and curiosity offer in fact a more realistic and honest foundation to preserve the species.

2. Economic values

One of the main reasons to conserve crocodiles in the wild is that people can derive cash benefits through *sustainable use*. As the Swiss naturalist Charles Guggisberg (1972: 183) argued:

> "In view of the materialistic times we live in, the economic value of crocodilians – especially with regard to the skin trade – is sure to furnish by far the strongest arguments for assuring their survival."

In several countries, crocodile ranching has become an important income-generating activity and provides an incentive to conserve crocodiles and wetland habitat (Webb et al. 1987). Rural communities in Papua New Guinea, for example, earn money through the sale of juvenile crocodiles to commercial crocodile farms and therefore actively protect crocodile nests (Cox 2009). Over the past 25 years, sustainable use has been the guiding principle of crocodile conservation in the Philippines. In 1987 the Philippine government set up a crocodile ranching program to conserve crocodiles and alleviate rural poverty: the Crocodile Farming Institute. It was envisioned that setting up a crocodile leather industry would provide people living in crocodile habitats an incentive to conserve the species. In the words of Gerardo Ortega, the former executive director of the Crocodile Farming Institute: "to instill in trappers the relative economic importance of a ferocious living crocodile, relative to a harmless dead one" (Ortega et al. 1993: 126).

The regulated harvest of crocodile skins is, however, not a viable conservation strategy for critically endangered species such as the Philippine crocodile (Thorbjarnarson 1999). With less than 100 mature individuals surviving in the wild, extractive use is simply not an option; and will not be so in the foreseeable future. The Crocodile Farming Institute had to abandon its plans to develop a crocodile leather industry and has instead focused on breeding crocodiles in captivity. The reasoning that local people living in Philippine crocodile habitats can make money with the harvest of crocodile skins is unrealistic: the benefits of a sustainable use program are too distant and insecure to use as a justification for in situ crocodile conservation. Nonetheless, policymakers and conservationists continue to promote the economic importance of crocodiles in the Philippines (van der Ploeg et al. 2011c).

In cases where direct use is problematic conservationists tend to promote non-consumptive uses, particularly *ecotourism*. In this view, rural households can earn money by guiding, or catering to, tourists. In northern Australia, for example, saltwater crocodiles bring in much needed "tourist-dollars," which form an important incentive to protect the species in the wild (Ryan and Harvey 2000). A similar success story from the Philippines is the community-based whale shark tourism enterprise in Sorsogon Province that succeeded in improving people's incomes and minimizing illegal fishing (Pine et al. 2007). It is, however, unlikely that crocodile tourism can generate substantial benefits for communities in the northern Sierra Madre. Poor accessibility, equity issues and a civil insurgency form major constraints for the development of ecotourism infrastructure in this remote rural area. Moreover, the linkage between organized crocodile-watching tours and

effective protection of the species and its wetland habitat level is not as straightforward as is often assumed (Brown 1998). All the same, ecotourism remains a popular "green development fantasy" and is actively promoted by local governments.

In many cases, conservationists use *indirect benefits* (indirect in the sense that they are not generated through the use of crocodiles, or dependent on the survival of the species in the wild) to convince people to protect nature and wildlife (Ferraro and Kiss 2002). Most conservation organizations nowadays integrate developmental activities in their projects to mobilize local support (Adams et al. 2004). Improving rural livelihoods is obvious an important and legitimate goal in itself, especially in areas where most households live below the poverty threshold. But things become problematic when developmental aid is presented or perceived as a reason to conserve wildlife. Paige West (2006), for example, documents how local people in the Crater Mountain Wildlife Management Area in Papua New Guinea understood that they would get healthcare, education and consumer goods in return for their cooperation in protected area management. Such expectations inevitably lead to disappointments for both parties, as the promised or expected economic benefits often do not materialize and unsustainable resource use continues (Oates 1999). In the northern Sierra Madre, the Mabuwaya Foundation facilitated the construction of water pumps to minimize human–crocodile interactions, local governments prioritized the maintenance of farm-to-market roads in villages where Philippine crocodiles occur, and the DENR issued tenure instruments to farmers living adjacent to crocodile sanctuaries on the condition that they maintain a riparian buffer zone. These integrated conservation and development projects generated a lot of goodwill and built trust between government officials, conservationists and rural communities. However, developmental aid should not be used as an argument to conserve crocodiles in the wild. The effectiveness, legitimacy and sustainability of such a contract between conservationists and rural communities to conserve biodiversity in exchange for development are doubtful (Utting 2000).

3. Ecological values

Another often-heard reason to protect crocodiles in the wild is that these large predators play an important role in maintaining the productivity and diversity of wetland ecosystems on which people depend. In their book *Soul of the Tiger* Jeffrey McNeely and Paul Spencer Sochaczewski (188: 205), for example, write:

> "Studies have shown that the presence of crocodiles in a river actually *increase the yield of fish*, which by itself justifies the veneration village societies have for the beasts. Crocodiles eat ailing fish in a significant higher proportion than healthy fish, thus improving the common health of the fish stock. By preying on the most common fish, they balance the fish population; any species which suddenly becomes dominant is put back in its proper proportion. Crocodile droppings are nutritious for the fish and contain critically important chemicals."

There is in fact little empirical evidence for the claim that crocodiles improve fish catches. Carlos Peres and Anina Carkeek (1993) describe how black and spectacled caimans in the Amazon damage gill nets and thereby reduce the efficiency and profitability of commercial fishing operations. In doing so, the caimans indirectly benefit subsistence fishermen whose fishing lines are rarely damaged. This hardly

seems a convincing reason to protect crocodiles in the wild. Indeed the authors acknowledge that "as a result commercial fishermen are antagonistic towards caimans and many medium-sized to large individuals are shot on sight" (Peres and Carkeek 1993: 228–229). But also local fishermen profoundly dislike the caimans and do not seem to understand the role the animals play in curbing overfishing.

Crocodilians are seen as *keystone species* in freshwater ecosystems. American alligators in Florida for example create and maintain deep ponds that provide a refuge for many species of fish, frogs and snakes during dry periods (Mazzotti et al. 2008). It is argued that the extinction of such a large predator could disrupt fundamental ecological processes and damage the entire ecosystem. Taking these insights one step further, Ben Malayang (2008: 18), a former undersecretary of the DENR, argues that "the disappearance of crocodiles would appear to be one major contributory factor to the demise of our large river systems." This reasoning, however, does not stand close inspection. Freshwater wetlands in the Philippines have been altered by pollution, over-exploitation, flow modification, habitat degradation and invasive species (Department of Environment and Development and United Nations Environment Program 1997). Rivers have been dammed, watersheds logged, and once abundant fish species wiped out by fishing with dynamite, electricity and pesticides. Over the past 60 years, freshwater wetlands in the Philippines have undergone unprecedented ecological changes. Obviously, these transformations are not caused by the extermination of the Philippine crocodile. Conversely, it seems improbable that these ecosystems will be restored to their original state by reintroducing these apex predators (see for example Terborgh and Estes 2010).

In the 1990s, the DENR tried to convince the Filipino public to protect crocodiles by arguing that crocodile "excrements" fertilize the rivers and thereby maintain the food chain (Figure 1). The Wildlife Conservation Society of the Philippines (1997: 81) argued that "crocodiles are important to aquatic ecosystems, not only in keeping the balance by controlling population growth of prey species, but also valuable in the maintenance of residual waterholes during dry periods and inhibition of encroachment of aquatic plants by their constant movement". Actually, very little is known about cascading trophic interactions and disturbance dynamics in freshwater wetlands in the Philippines. In any case, fishermen in the northern Sierra Madre do not believe that more crocodiles will lead to higher fish catches: in their perception crocodiles eat fish and destroy fishnets.

In dialogues with rural communities the Mabuwaya Foundation, therefore, does not focus on the ecological value of crocodiles but emphasizes the importance of wetlands (Figure 2). Freshwater ecosystems provide important *environmental services* for poor rural communities in the northern Sierra Madre. Rural communities are confronted with declining fish catches, erosion and flooding. By adopting a broader ecosystem approach, the foundation aims to mobilize societal support for Philippine crocodile conservation. With considerable success: village councils banned the use of destructive fishing methods and proclaimed 18 fish sanctuaries. This facilitates the recovery of the species and directly benefits the community: fishermen report that fish catches are increasing in areas adjacent to the sanctuaries. The Philippine crocodile is the flagship species for these community-based conservation efforts. But strictly speaking, crocodiles are not necessary to maintain fish stocks, provide clean water and regulate floods. To paraphrase David Reed (2002): "the environment is not a crocodile." The fact that freshwater

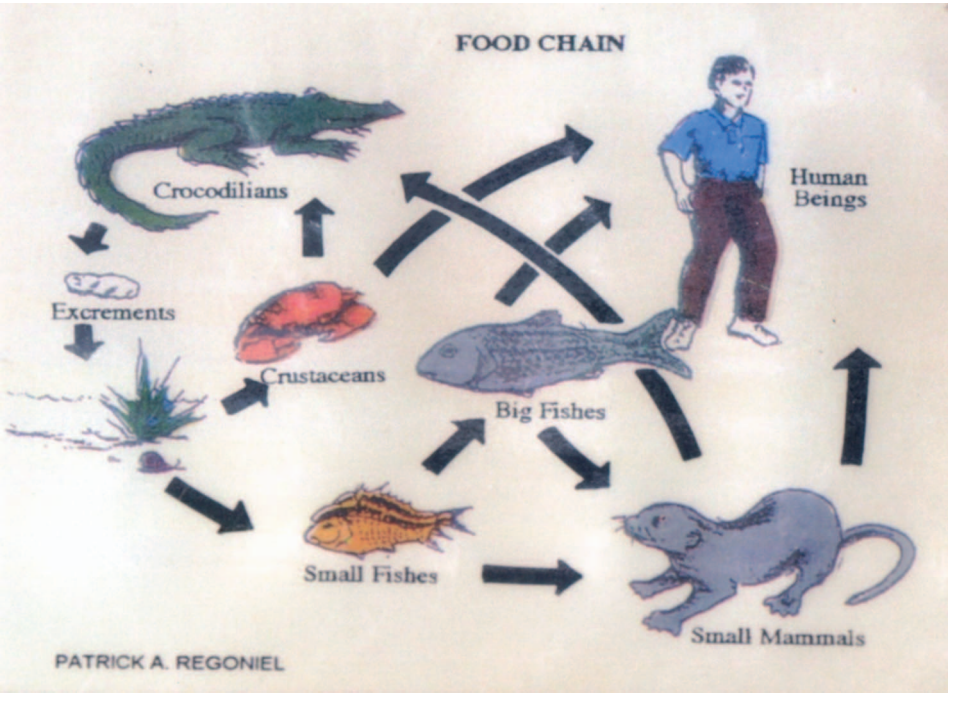

Figure 1. Poster of the Crocodile Farming Institute explaining the role of crocodiles in freshwater ecosystems.

ecosystems deliver a wide range of services on which rural communities depend is in itself not a valid reason to protect the species.

4. Cultural values

A third justification to conserve crocodiles in the wild is that crocodiles contribute to human well-being. The conservation of species and habitats is important for aesthetic, recreational, scientific, spiritual and psychological reasons (Adams 1996). Jose Rizal, the founding father of the Philippine Republic, was one of the first to recognize that crocodiles are fundamentally linked to Filipino culture and identity:

> "Other nations have great esteem for the lion or the bear, putting them on the shields and giving them honourable epithets. The mysterious life of the crocodile, the enormous size that it sometimes reaches, its fatidic aspect, without counting anymore its voraciousness, must have influenced greatly the imagination of the Malayan Filipinos" (Rizal cited in Nocheseda 2002: 75).

It can be argued that crocodiles form an important part of Filipino *cultural heritage*. In the pre-colonial Malay World crocodiles were worshiped as the embodiment of the ancestors, spirits or gods. Throughout the archipelago, crocodiles were symbols of sexual fertility and physical power, and associated with agricultural productivity. Crocodiles were seen as the guardians of the underworld: divine creatures that guarded the social order. This veneration is reflected in oral history

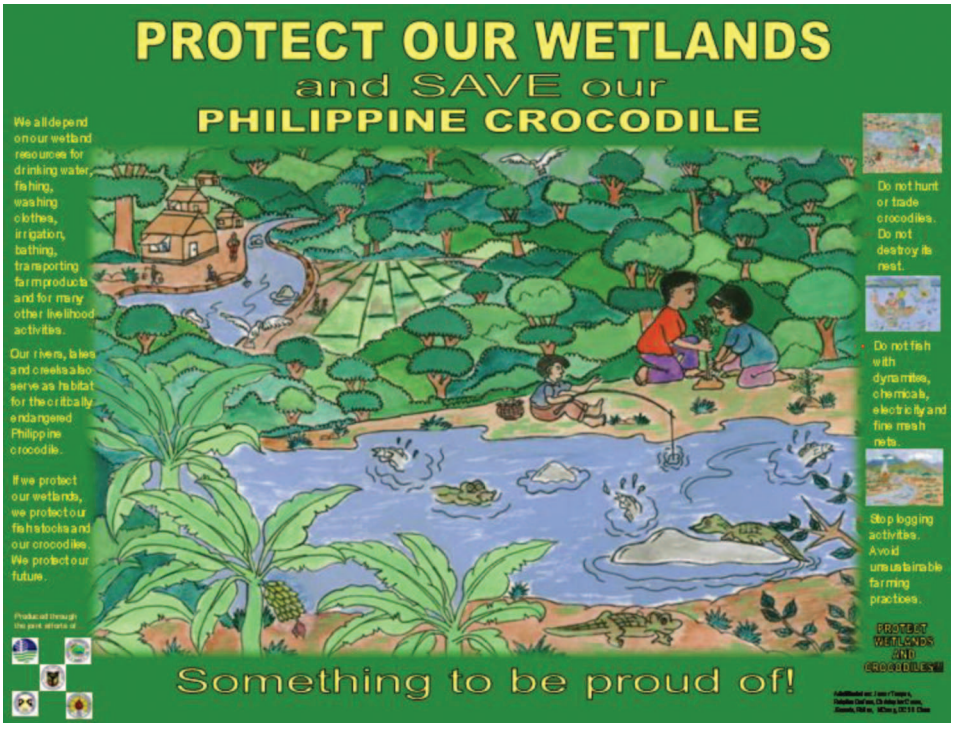

Figure 2. Poster of the Mabuwaya Foundation explaining the value of wetlands.

and material culture. But Catholicism, colonialism and capitalism fundamentally transformed people's attitudes towards crocodiles (van der Ploeg et al. 2011a). Nowadays most people see crocodiles as man-eaters that should be exterminated. Movies, advertisements, comic books and zoos reinforce the image of crocodiles as treacherous and voracious beasts. In mainstream Filipino culture crocodiles are associated with greed and corruption. Few people are aware of the role of crocodiles in Philippine culture and history (although Elias' epic fight with a crocodile in Rizal's novel *Noli me Tangere* is probably the only thing most high-school students remember of the compulsory Filipino Language and Literature classes). All in all not an ideal starting point to convince people to protect crocodiles in the wild.

Interestingly, not everyone sees crocodiles as dangerous animals. In the remote rural areas of the Philippines people have more tolerant attitudes towards crocodiles. The Magindanaon on Mindanao for example believe they descend from crocodiles. The Tagbanwa on Palawan claim that their ancestors made a blood pact with crocodiles. And the Kalinga on Luzon think that crocodiles are the embodiment of the ancestors. These *spiritual values* provide some form of protection for the species. Indigenous people in the northern Sierra Madre claim that crocodiles do not pose a danger as long as people "respect" the animals. In Lumalug, for example, women regularly place an offering near the creek to appease the "grandfather crocodile." There is much debate on whether traditional beliefs and practices form a sound conservation ethic (Diamond 1986; Johannes 2002). In any case, many people in Lumalug say they "no longer follow these superstitious beliefs." Assimilation,

modernization and evangelization are rapidly eroding the traditional belief systems. Basing the Philippine crocodile case on these mystic values, therefore, does not seem a promising strategy.

When it becomes difficult to nurture existing cultural values, conservationists can try to create a new conservation ethic. Susana Padua, for example, describes how conservationists succeeded in turning the Black Lion-tamarin from a pest into a source of pride and excitement for rural communities in Brazil (Padua 1994). Over the past years, the Mabuwaya Foundation tried to foster a sense of *pride* in the occurrence and conservation of the Philippine crocodile (Figure 3). The slogan of the public awareness campaign reflects this objective: ''the Philippine crocodile: something to be proud of!'' The foundation distributed posters, newsletters and comic books to households living in crocodile habitat, gave lectures in schools to raise awareness on the plight of the critically endangered species, and brought schoolchildren to the field to see crocodiles in the wild. Students of Isabela State University performed crocodile dance shows in remote villages during the annual town fiesta. Training workshops were organized to enhance the capacity of village leaders to protect crocodiles and wetlands. As a result, attitudes towards in situ Philippine crocodile conservation are changing: the fact that this iconic species has been exterminated in most parts of the country but survives in their village is a strong motivation for local people to support conservation action.

Figure 3. Billboard with the slogan of the public awareness campaign of the Mabuwaya Foundation: ''banag a maipagpannakkel!'' (something to be proud of!). Photo by M van Weerd (2008).

Cultural values can play an important role in making global conservation priorities such as the Philippine crocodile locally relevant. The role of pride, joy and interest in building a local constituency for conservation has, however, been largely ignored by conservationists and policy makers (Posey et al. 1999; Infield 2001). It is often argued that aesthetic, naturalistic or moralistic values are insufficient to convince people to protect wildlife, especially in the world's poorest regions. For people that struggle to make a living the argument that crocodiles are an emotional and intellectual enrichment may sound hollow: "beneficence, awe, reconciliation, and communion are not entirely probable attitudes for the poverty stricken living in overcrowded barrios" (Orr 2000: 144). Yet people in villages like Lumalug are often interested in the natural history of the species and enjoy sharing stories about crocodiles. We have spent many pleasant evenings talking with people about enchanted crocodiles, encounters with crocodiles under water and the magical properties of crocodile scutes. Undoubtedly, people have more important problems on their mind than the plight of the Philippine crocodile. But the claim that poor people have no need or ability to affiliate with nature cannot be upheld (Kellert 1996). Such a claim risks ignoring people's history, culture and identity, and reducing them to being nothing else than poor.

5. Intrinsic values

Conservationists' last argument to justify the protection of crocodiles in the wild is their *intrinsic value*. John Muir, one of the founding fathers of the environmental movement, for example reasoned that people have the moral obligation to preserve crocodilians not only because of their suitability for human use but also for their own good:

> "Many good people believe that alligators were created by the Devil, thus accounting for their all-consuming appetite and ugliness. But doubtless these creatures are happy and fill the place assigned them by the great Creator of us all. [...] How narrow we selfish, conceited creatures are in our sympathies! How blind to the rights of all the rest of creation! [...] Through alligators naturally repel us, they are not mysterious evils. They dwell happily in the flowery wilds, are part of God's family, unfallen, undepraved, and cared for with the same species of tenderness and love as is bestowed on angels in heaven or saints on earth. [...] Honorable representatives of the great saurians of an older creation, may you enjoy your lilies and rushes and be blessed now and then with a mouthful of terror-stricken man by way of dainty" (Muir 1916: 98)

It is, however, often argued that the idea that nature has intrinsic value and needs to be preserved is a typically western construction (Grove 1995), which might be appealing to educated urban elites but has little practical value for impoverished people living in crocodile habitat: "*Erst kommt das Fressen, dann kommt die Moral*."[1] The preservation of wildlife and wilderness on intrinsic grounds has in the past led to the exclusion and marginalization of rural communities (Ghimire and Pimbert 1997). Conservationists who stress that crocodiles should be conserved for their own sake risk being portrayed as naïve romanticists, utterly disconnected from socio-economic realities in the Third World; or worse as "green imperialists" or "eco-colonialists" (Crowe and Shryer 1995: 26). As another former DENR undersecretary, Ferrer (2008: 9), recently remarked: "those of us who admire crocodiles need only to know that they exist, but this opinion is very much the exception for the people who have to share their habitat with crocodiles."

The idea that crocodiles have an intrinsic value has in fact a broad social basis in the northern Sierra Madre. In 2007, we interviewed 549 people on Philippine crocodile conservation to assess the impact of the public awareness campaign of the Mabuwaya Foundation. One of the questions we asked was if people agreed or disagreed with the proposition: ''crocodiles have the right to live.'' The results were surprising: 93% of the respondents agreed with the statement (see for methods, other results and discussion: van der Ploeg et al. 2011b). Interestingly, there was no correlation with education, affluence, ethnicity, sex or the perceived risks and benefits of conserving crocodiles. Apparently most people in the northern Sierra Madre, irrespective of their income, descent or livelihood strategy, somehow endorse the notion that crocodiles have an intrinsic right to exist.

This universal tendency to affiliate with nature provides a starting point to mobilize broad public support for conservation (Wilson 1992; Kellert 1996). Education can nurture this inherent ''love for nature'' and transform it into active support for environmental protection, also in the developing world (Kals et al. 1999: 180). In fact, conservation organizations in Europe, the US and Australia rely heavily on intrinsic values to raise awareness and generate funding. But in the tropics, the same conservation organizations largely ignore the potential of preserving wildlife on moral grounds (Kuriyan 2002).

6. Conclusion

To build an inclusive constituency for the conservation of the Philippine crocodile, it is essential to communicate a clear and, perhaps even more important, sincere conservation ethic. Conservationists, scientists and policy makers mainly rely on utilitarian logic to justify in situ crocodile conservation. The danger of focusing solely on economic values and environmental services is twofold. First, by promising tangible benefits to rural communities conservationists often create unrealistic expectations. This undermines the credibility of conservation organizations and can ultimately alienate local people from nature conservation. It is one thing to deceive ourselves; it is another to misinform poor rural communities.

Second, by framing conservation as an economic issue, conservationists risk obscuring other valid motivations to conserve crocodiles in the wild (Jepson and Canney 2003; Martin et al. 2008). ''Why'' an editorial in *The Economist* (2010: 16) rhetorically asked ''should local governments spend money protecting something that does not bring in any cash? Why should a farmer give up his land for a worthless creature that often eats his livelihoods?'' Such presumptuous questions neglect cultural and intrinsic values that form a legitimate reason to conserve wildlife and inspire changes in people's behaviour. In the end, conservationists must not be guided by such ideological preferences, but by what works best in a specific context (Robinson 2011). Love, respect, pride and curiosity are in fact the best (and probably only) arguments to mobilize local support for Philippine crocodile conservation. To paraphrase Douglas McCauley (2006: 28): by appealing to people's hearts, rather than to their crocodile leather wallets, conservationists can motivate people to conserve the Philippine crocodile in the wild.

Note

1. ''First comes chow, then morals.''

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