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Swallowed by a cayman : integrating cultural values in Philippine crocodile conservation

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9. CONCLUSION

Crocodiles are a conservation success story. Commercial hunting led to the depletion of crocodile, alligator and caiman populations in most parts of the world (Guggisberg 1972). But populations rapidly recovered following protective measures and the regulation of the international trade in crocodile leather. In many countries crocodile cropping, ranching or farming programs now generate substantial cash revenues for communities in remote areas, and thereby provide an economic incentive to preserve crocodiles and their wetland habitat. The sustainable use of crocodiles is widely regarded as a model for linking wildlife conservation to rural development; a pragmatic and more just alternative to a strict protectionist approach (Webb 2002; Adams 2004).

The limits of the sustainable use model are however increasingly becoming clear (Hutton & Leader-Williams 2003). The global crocodile leather market has proved to be highly volatile. Profits derived from extractive use are often captured by a few individuals, and rarely benefit communities living in crocodile habitat. Moreover, extractive use appears not to be a feasible conservation strategy for severely threatened species such as the Philippine crocodile (Thorbjarnarson 1999).¹ Efforts to set up a crocodile leather industry in the Philippines have not improved the management of the few remaining Philippine crocodile populations in the wild, and failed to generate revenues for people living in crocodile habitat. Nonetheless, utilitarian views continue to dominate Philippine conservation policy (see chapter 3). Policymakers and conservationists argue that rural poverty forms a critical constraint on conservation efforts, and that it is imperative to improve the well-being of communities living in crocodile habitat, if not by means of crocodile farming then through ecotourism, or so-called 'alternative livelihood projects'.

In reality, alleviating poverty in remote rural areas is a gargantuan challenge. Basic healthcare, primary education, safe drinking water, electric power and roads are often absent in villages in the northern Sierra Madre such as Dibuluan, Disulap, San Jose, Ibutan, Baliao, Buyasan, Cadsalan and Tappa where Philippine crocodiles still occur in the wild. Raising the income of the approximately 9,000 people living in these barangays to, say, a mere PhP. 40 (US\$ 0.8) per day, the poverty threshold as set by the Philippine government, will be extremely difficult, not to say impossible with the scarce financial resources available for conservation in the Philippines. It may require constructing farm-to-market roads, improving sanitation, education and healthcare, granting access to credit, advising farmers on new farming techniques and crop varieties, ensuring fair prices for agricultural products, recognizing land rights, enforcing the rule of law, empowering women and many other interventions. And whether such a rural development strategy will actually mitigate threats to the Philippine crocodile population remains highly uncertain.

Some conservationists therefore advocate a return to strict protectionism,

particularly in densely populated areas where uncontrolled resource extraction will lead to irreversible environmental damage (Rudel & Roper 1997; Wilshusen *et al.* 2002). However, such a resurgent 'fines and fences' approach doesn't seem to be particularly promising in the Philippines. Despite the hefty penalties prescribed in the Wildlife Act of 2004, Philippine crocodiles continue to be killed, most often without any reaction of the authorities. The DENR lacks the political support, resources and capacity to enforce environmental legislation on the ground. Moreover, many government officials consider crocodile conservation wholly unimportant, and sometimes even illegitimate in a context of rural poverty (see chapter 4). Rural communities often consider State-imposed restrictions on resource use as arbitrary and unjust, and resist their implementation. Most protected areas in the Philippine archipelago remain 'paper parks' where hunting, logging, dynamite fishing and wetland conversion continue unabated (World Bank 2003; Persoon & van Weerd 2006).²

Others have simply given up on the Philippine crocodile. The prominent conservation biologist John Terborgh for example argues that faced with the reality of rapid population growth, corruption in government and little public support for conservation, it would probably be better to cease in-situ conservation efforts in the Philippines, and instead use the scarce financial resources to maintain the most spectacular endemic species such as the Philippine crocodile in captivity 'as a reminder of our collective impotence to hold back the forces of extinction' (1999: 183-184). His pessimism is widely shared: the Wildlife Conservation Society of the Philippines concluded that 'there is *little future* for Philippine crocodiles in the existing (and proposed) wildlife sanctuaries, and that captive breeding is the only hope for the species until public sentiment and awareness permit effective protection and implementation of reintroduction programs' (WCSP 1997: 78-79, emphasis added).³ Such negativism ignores that indigenous people living in Philippine crocodile habitat actually tolerate crocodiles in their surroundings, and do not see a fundamental problem with co-existence (see chapter 2). More problematic, it diverts attention and resources away from efforts to conserve the species in the wild.

Over the past years the Mabuwaya Foundation has worked with rural communities and local governments to preserve the Philippine crocodile in its natural freshwater habitat. Conservation efforts focus on raising awareness on the plight of the species, protecting critical freshwater wetland habitat and re-enforcing the Philippine crocodile population in the northern Sierra Madre. The foundation distributes posters, calendars and newsletters, performs dance and puppet shows, organizes field visits to see crocodiles in the wild, facilitates community consultations and assists local government officials in the design and implementation of environmental legislation. As a result, most people living in Philippine crocodile habitat now know that the species is legally protected, and support in-situ conservation efforts (see chapter 6). The local government of San Mariano enacted legislation protecting the species in the wild,

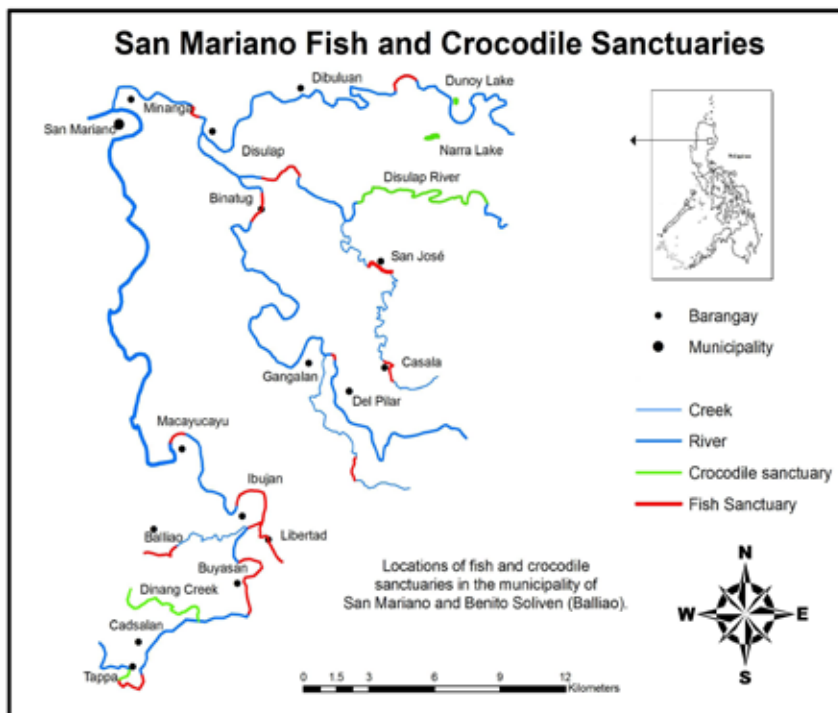
banned the use of destructive fishing methods, proclaimed Disulap River as a Philippine crocodile sanctuary and deputized 12 guards to protect critical nesting sites in the municipality. A head-start program was set up to increase recruitment rates: crocodile nests are protected, hatchlings collected in the wild, raised in captivity and eventually released back into the wild (van Weerd & van der Ploeg 2008).⁴

The experiences in San Mariano challenge the view that rural communities will only conserve crocodiles when they profit financially from it. In this thesis I have demonstrated that community-based conservation efforts in the northern Sierra Madre are primarily motivated by culture, ethics and emotion. Traditional beliefs and knowledge offer, at least most of the time, a foundation for co-existence (see chapter 8). Most people in San Mariano share the idea that the species has the right to exist, and should not be allowed to go extinct. Awe for an elusive predator, interest in ecology and natural history, pride in the occurrence of an iconic species, excitement of seeing a rare animal in the wild, pleasure in sharing stories about a large and potentially dangerous beast, responsibility for the Creation, concern about environmental degradation, respect for the law and an eagerness to 'do good' turn out to be important reasons why people support the conservation of the Philippine crocodile in the wild. Such an argument might easily be dismissed as hopelessly romantic, elitist or even irrational. But people, also poor farmers, fishers and hunters in the Third World, are guided by much more complex motivations than is generally assumed in ecological economics. There is more in life than carrots and sticks. Conservationists need to recognize that knowledge, emotion and culture are at the heart of nature conservation (Milton 2002). Conservation strategies will only succeed if they reflect, strengthen and build upon the wide range of views, values and needs of local people (Robson & Berkes 2010). Here lays, in my view, an important task for anthropology. To design effective conservation measures it is essential to have a detailed understanding of people's relationships with nature; not by making a priori assumptions about antagonism and economic incentives, but by collecting empirical data, formulating novel questions and thinking creatively (*cf.* Walters & Vayda 2009).

I am not suggesting that economic incentives are not important for conservation. San Mariano is one the poorest municipalities of the Philippines, and conservationists working in such a context should evidently take people's basic needs into account (Kaimowitz & Sheil 2007). 'How can we benefit?' remains a recurrent question during community consultations in San Mariano (see chapter 5). Philippine crocodile conservation is in fact intimately linked to rural livelihoods. The widespread use of destructive fishing methods, for example, is not only a severe threat to the species, but also erodes the resource base upon which rural communities heavily depend. There is broad social support to address this problem, and 14 barangay councils have created a freshwater protected area (figure 9.1).⁵ The idea is that the establishment of a no-take zone will allow fish stocks to recover, and to 'spill-over' into other areas

where they can be caught by fishers (Alcala & Russ 2006; Leisher *et al.* 2010). These community-conserved areas provide tangible benefits to rural communities, and create the necessary conditions for the recovery of the Philippine crocodile.⁶

Figure 9.1: A network of community-conserved areas in San Mariano (Mabuwaya Foundation 2011)

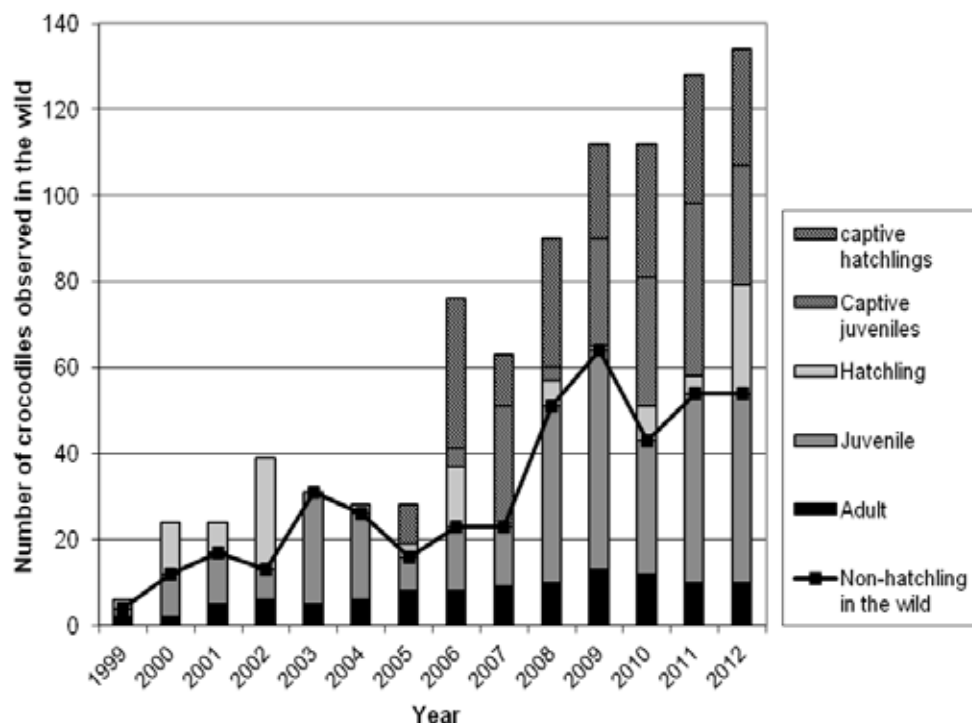


It is however important to be realistic and honest about economic incentives (see chapter 7). Freshwater protected areas enable people to catch and eat more fish, but cannot eradicate poverty. The impact of integrated conservation and development projects, such as distributing fruit trees, constructing water pumps, or setting up a payment-for-ecosystem-services system, on the income of rural households is generally small (Adams *et al.* 2004).⁷ Fruit trees prevent erosion and improve nutrition, but do not provide a stable source of cash income for farmers in San Mariano. Water pumps provide clean water, but much more is needed to improve health conditions in remote villages in the northern Sierra Madre. Well-meant efforts to improve the quality of people's lives often lead to mistrust, confusion and friction within communities, and between communities, government and conservationists, especially when the benefits fail to

materialize (Utting 2000). Moreover, the conservation outcomes of these interventions are often unclear (Kellert *et al.* 2000; Ferraro & Kiss 2002). Raising awareness, fostering pride and building the capacity of local government officials is, in the end, a more pragmatic, pro-poor and realistic strategy to mobilize local support for the protection of the Philippine crocodile than crocodile farms and ecotourism enterprises.

Ultimately, the success of the community-based Philippine crocodile conservation project depends on the number of crocodiles surviving in the wild. The crocodile population in San Mariano has been monitored on a quarterly basis since 1999.⁸ Figure 9.2 summarizes the results: there has been a marked increase in the number of non-hatchling Philippine crocodiles surviving in the wild, from 12 in 2000 to 54 in 2012, particularly after 2007 when the first captive-raised juveniles were released into the wild.⁹ Significantly, the number of successfully hatched crocodile nests has increased, from fewer than two nests per year between 2001 and 2005, to an average of four nests per year since 2008. Extinction is not inevitable: there is a future for the species.

Figure 9.2: Philippine crocodile population in San Mariano (1999-2012)



The fence has long been a powerful and contested symbol for nature conservation. On the one hand, its advocates argue that strict protection is the best, perhaps even the only, solution to preserve wildlife and wilderness in the Anthropocene (Packer *et al.* 2013). On the other hand its opponents warn that 'fortress conservation' has led to the exclusion and marginalization of rural communities, and may in the end be inimical to conservation's cause (Adams & Hutton 2007; Brockington & Igoe 2006). Eric Meijaard and Douglas Sheil (2008) argue that the dollar sign would therefore be a much better symbol for conservation; one that emphasizes the economic value of nature. This utilitarian logic increasingly dominates conservation science, policy and practice, particularly in developing countries. In this thesis I have argued that it is possible to base conservation on other grounds than economic rationality. Pride, interest and respect are important reasons for people in the northern Sierra Madre to protect the Philippine crocodile. The challenge is to integrate these cultural and moral values into conservation strategies (Infield 2001; Adams 2004). In that sense the heart would perhaps be a more appropriate symbol for conservation. Neither fences nor dollars will save the Philippine crocodile. But love perhaps can.

ENDNOTES

1. The Asian crocodilians pose a specific conservation challenge, or at least form a more urgent and pronounced problem than in other tropical regions, a reflection of exceptional high rates of biodiversity loss in South and Southeast Asia (Hoffmann *et al.* 2010; Thorbjarnarson *et al.* 2002; Nair *et al.* 2012). The regulation of trade has not led to improved management of wild crocodile populations in Asia: of the seven species that occur in the humid tropics of Asia, six remain threatened with extinction (Martin 2008; Dudgeon 1992). The Philippine crocodile, Chinese alligator (*Alligator sinensis*), Indian gharial (*Gavialis gangeticus*) and Siamese crocodile (*Crocodylus siamensis*) are all classified as critically endangered on the IUCN Red List (IUCN 2010). Two other Asian crocodilian species, the Malay gharial (*Tomistoma schlegelii*) and the mugger (*Crocodylus palustris*) are respectively classified as endangered and vulnerable. The saltwater crocodile is also severely threatened in South and Southeast Asia, but as populations have recovered in the wild in Papua New Guinea and northern Australia the species has been delisted from endangered to vulnerable in 1990 and from vulnerable to lower risk in 1996 on the IUCN Red List (Webb *et al.* 2010). Crocodile leather is an important export product in several Asian countries: there are for example more than 700,000 Siamese crocodiles on crocodile farms in Vietnam, Thailand and Cambodia (Simpson & Bezuijen 2010). Unfortunately, this is not leading to the management of the wild crocodile populations. The collection of hatchlings in the wild to stock crocodile farms in fact poses a severe threat to the last breeding Siamese crocodile populations in Laos and Cambodia.
2. Most Philippine crocodiles in fact survive outside national parks in intensively used agricultural areas, and the prospects of expanding the protected area system seem unlikely in the current sociopolitical

context.

3. Government efforts to breed the Philippine crocodile in captivity have been successful. But concerns about genetics, habitat, protection and societal resistance have inhibited the reintroduction of the species into the wild. In July 2009 50 captive-bred sub-adult crocodiles from the PWRCC were reintroduced in Dication Lake in the Northern Sierra Madre Natural Park (van Weerd *et al.* 2010). The results of this pilot project are however not encouraging. Most crocodiles have died, raising questions about the fitness of the released crocodiles and the suitability of the habitat. *C. mindorensis* seems to prefer small creeks and ponds in the uplands (Ross 2008). However the reintroduction in Dication Lake has generated valuable information and insights that can be useful for future reintroductions, and has demonstrated that crocodiles can be reintroduced to the wild with the consent and cooperation of rural communities (van Weerd & van der Ploeg 2012).
4. Eighty-five captive-raised juvenile Philippine crocodiles were released into the wild in San Mariano since the start of the head-start program in 2007.
5. The rules in these community-conserved areas vary across sites and reflect the specific problems, needs and values of rural communities. Barangay Libertad, for example, declared a part of Disalug Creek as a 'sustainable fish sanctuary' where fishing is not allowed. Barangay Tappa, on the other hand, only prohibited the use of '*bung bong*, electro fishing, cyanide fishing, fine nets and other destructive ways of fishing' in the Ilaguen River. Fishing inside the fish sanctuary is also allowed in barangay Casala, but only during the barangay fiesta and the *canao* (the harvest festival). And barangay San Jose specifically prohibited the cleaning of pesticides sprayers in Ditali Creek and the disposal of garbage along the banks.
6. The clearing of riparian vegetation is another serious concern for rural communities. Many farmers are actually eager to plant trees along creeks on their land. Trees provide shade, fodder, fruits, timber and firewood, and reduce soil erosion. But farmers often lack the financial resources to invest in good planting material (Snelder & Lasco 2008). The provision of seedlings, fertilizer and technical advice can overcome these constraints, and stimulate farmers to maintain riparian vegetation. The Mabuwaya Foundation assisted the farmers' cooperative in San Isidro to reforest 16 hectares around Narra Lake: farmers now harvest *kalamansi* and jackfruit. In Dinang Creek the foundation and the municipal government distributed 1,500 timber tree seedlings and 4,500 fruit tree seedlings to farmers living adjacent to the creek in an effort to reforest the buffer zone of the Philippine crocodile sanctuary.
7. Performance-based payments for wildlife conservation are becoming increasingly common (Pattanayak *et al.* 2010; Dinerstein *et al.* 2012). Since 2011, the Mabuwaya Foundation is experimenting with direct payments to encourage people living in Philippine crocodile habitat to protect the species. The 4C project (Cash for Communities Conserving Crocodiles) pays PhP. 1000 for every crocodile surviving in the wild to the village in which the animal is observed. Every year staff members of the foundation count the number of Philippine crocodiles in the wild in cooperation with barangay officials. Based on the results of these participatory counts, money is transferred to the barangay development fund, a savings account managed by the elected village council for local development priorities. The barangay council decides how to allocate the money. The amounts that are involved appear relatively small, but they are substantial for rural communities in the northern Sierra Madre. In 2011, for example, the PhP. 35,000 was awarded to barangay Dibulan and PhP. 13,500 to barangay Disulap. To receive similar cash

amounts from the municipal government, barangay officials have to go through lengthy bureaucratic procedures. These direct payments generated support for in-situ Philippine crocodile conservation, and provide an incentive to prevent the killing of crocodiles. Above all, communities see the payments as recognition of their efforts to protect the Philippine crocodile. There are of course some concerns: in most cases the money is used for local development purposes, such as painting the school, buying chairs for the annual fiesta or building a multipurpose pavement for drying corn and playing basketball, activities that have no direct impact on the survival of the Philippine crocodile. In some areas people complain that the benefits do not go to people living adjacent to the crocodile sanctuaries. In Dunoy, for example, people think that the money should be spent on development in their *sitio*, and not in Dibuluan. Nevertheless, these conservation payments appear to be a valuable tool to encourage co-existence (*cf.* Dickman *et al.* 2011).

8. Crocodile habitat is traversed at night on foot by small teams of trained observers. Individual crocodiles are located using flashlights and whenever possible separated into three size classes: adult (total length > 1.5 m), juvenile (30 cm to 1.5 m) and hatchling (< 30 cm) (van Weerd & van der Ploeg 2004). These night surveys are a standard method to monitor crocodile populations in the wild (Bayliss 1987). They however tend to underestimate the number of crocodiles: it's often impossible to survey an entire area and crocodiles can be notoriously difficult to detect. Therefore the results of repeated spotlight surveys are usually interpreted as a population index: an indicator of general population trends.
9. It is important to note that these figures represent minimum population counts in the three breeding areas: Dunoy Lake, Disulap River and Dinang Creek. The actual Philippine crocodile population in San Mariano is likely to be larger: some individuals are not counted in these sites, and crocodiles are occasionally observed by people in other areas in San Mariano.