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Special issue
Coexisting
with reptiles



Current Conservation carries the latest in research news from natural and social science facets of conservation, such as conservation biology, environmental history, anthropology, sociology, ecological economics and landscape ecology.

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Cover art **Labonie Roy**

Conservation, with its colonial legacy, continues to be dominated by the ideals of the urban elite and the pursuit of a monolithic, 'pristine' human-free nature. Contrary to the latter claim, a 2021 study published in *PNAS* demonstrated that "people have shaped most of terrestrial nature for at least 12,000 years". Moreover, it showed how the current biodiversity crisis is a direct result of the appropriation, colonisation, and intensified use of the biodiverse cultural landscapes long-sustained by prior societies.

This special edition on coexisting with reptiles (guest edited by Dr Simon Pooley) highlights our deep cultural connection with biodiversity, including the scaly, slithering kind. Moving away from Eurocentric narratives of coexistence, the articles in this issue acknowledge the tolerance of local people across the world who live in close proximity to dangerous wildlife. Here, their relationships with crocodiles, Komodo dragons and king cobras are often governed by mutual respect, fear and resignation, and neo-liberal conservation interventions could do more harm than good.

In what has been a terrible year for humanity with the ongoing war on civilians in Palestine, imagining a world where we coexist with reptiles might seemingly require a certain level of cognitive dissonance. Yet, it is precisely this renewal of our kinship with nature that will help us reclaim our kinship with each other.

P.S. This editorial represents my views alone and does not necessarily reflect those of the guest editor or contributors.

— **Devathi Parashuram**

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Introduction

Author **Simon Pooley** | Illustrator **Namitha Hebbal**

Coexistence with reptiles? Surely a preposterous idea! For the common perception of reptiles is that they are primitive life forms, cold-blooded, anti-social, emotionless, vicious and not infrequently dangerous. Well, in this special issue we set out, not to persuade you to join the basking crocodiles on a sun-drenched riverbank, nor to clasp a chilly cobra to your chest, but rather to show you that, whatever the authorities may warn or the media may report in shouty headlines, coexistence between particular human communities and particular potentially dangerous reptiles does, in fact, exist. These are not just-so stories.

We do not propose that you read these fascinating stories and rush out to strike up friendly relations with crocodiles, snakes or Komodo dragons who are perfect strangers to you. These stories concern communities of people and reptiles who have become familiar and accustomed to one another over many generations. Rather, we suggest there is something to be learned about what is possible, to widen the bandwidth of what is conceivable concerning communities of humans and of reptiles sharing the same landscapes.

In searching out these stories, I deliberately looked for a range of species (you may notice my inordinate fondness for crocodiles, for which I here express whatever regrets may be appropriate in the circumstances) which are well known for their power and potency and potential to harm our species. The examples hail from many regions of the world—Komodo dragons from Indonesia, cobras from different parts of India, crocodiles from East Timor, the Philippines, the Solomon Islands, and Gujarat. This is to demonstrate that coexistence with reptiles is not some quirk of a particular region, human culture or species of reptile.



The authors of these stories know their *Varanus banganorum* from their *Varanus marmoratus*, their *Osteolaemus tetraspis* from their *Osteolaemus osborni*, so to speak. I have met at least one author of each story, read their scientific publications and enjoyed their conference presentations. I had the privilege of spending several days in the field in Vadodara, Gujarat, with esteemed Indian herpetologist Dr Raju Vyas, during which he also showed me the remarkable urban mugger crocodiles of that city.

This general introduction will focus on two major topics. First, the nature of reptiles and the sorry (but improving) state of the study of reptiles and perceptions of their capabilities. Second, on what we mean by coexistence with wildlife, and how studying coexistence might improve our civility to other kinds of creatures in the future. For it is undeniable that, if on occasion reptiles have bitten, chewed or even swallowed cherished members of our own species, it is also true that there is much to be desired in how we have treated reptiles in return, most of them innocent of the crimes we attribute to certain species or even to entire families of reptiles (think of the poor snakes).

Reptiles are diverse, social and sophisticated

In 2021, Doody, Dinets and Burghardt published *The Secret Social Lives of Reptiles*, specifically to address the mistaken ideas that reptiles are, “solitary dull, slow moving, and [have] tiny brains and simple behaviour”, claims which they comprehensively demonstrate to be false “with actual data.” Even famous and influential biologists including Charles Darwin and Carl Linnaeus could not see past their mammal-centric prejudices towards reptiles, expressing both their dislike of the appearance of reptiles, and their ill-founded assumptions about the primitive natures and habits of reptiles. It bears remembering that both these individuals came from regions rather poor in reptiles, certainly in comparison to the warmer regions of the world where most reptile species are found. (Twenty years on, living in London in the UK, I still pine for the lizards, skinks

and geckos that so enlivened my childhood homes in northern KwaZulu-Natal, South Africa.)

You may not know that there are more than 11,000 described species of reptiles, more than every other group of tetrapods except possibly birds (which are arguably reptiles but customarily considered apart). And yet, reptiles have been given far less research attention than birds, fishes or mammals. This is partly because humans have less affinity to the ‘cold-blooded’ scaly reptiles, because some are dangerous and people fear and avoid them, because many are secretive and nocturnal, or they live in difficult habitats for humans to study them in, and much of their behaviour is therefore seldom observed.

Written observations of crocodile behaviour date back to the writings of the Greek historian Herodotus (5th century BCE), but it was only in the 20th century that parental behaviour was accurately described, for example by McIlhenny in Louisiana in the 1930s. Prejudice against crocodilians was so strong that even scientists who should have known better dedicated long sections of their descriptions of crocodiles to hair-raising tales of crocodile attacks, and advice on how to kill them. It was generally assumed that crocodiles eat their babies (not very adaptive, or likely, considering how long crocodylians have survived on earth).

When in the early 1970s, after a decade of patient observations, my father Tony described a mother Nile crocodile gently carrying her hatchlings in her mouth to a safe nursery area in the water, where she looked after them for several weeks, there was general uproar and disbelief. National Geographic, Time Life and the BBC dispatched film crews and photographers to capture evidence of this impossible claim. Of course, the crocodiles made them wait, and the desperate Americans flew in air conditioners and

ice cream to help them survive the heat and humidity of darkest Zululand in crocodile nesting season.

Despite a series of fascinating findings and publications in the 1970s, it is only in this century that another surge in reptile studies has begun, revealing a staggering range of social behaviours spanning communications (including from embryo to embryo!), vocalisations on land and underwater (including infrasound), communal creches, parental care by both parents, constructions of homes by single parents or collaborative groups, the forming of social groups including long-lived family groups and communal living, group vigilance, kin recognition, many styles of reproductive behaviour, including long-term monogamy and extended and gentle courtship, cooperation in hunting and feeding, play behaviour and social learning.

The elaborate displays of crocodylians in mating season are probably the most complex in all the

animal kingdom. They roar (or bellow), produce infrasound below the water creating a ‘dancing droplets’ effect above their submerged backs, perform head- and jaw-slaps, and do all this in a distinctive Head Oblique Tail Arched (HOT) posture (gharials don’t). They produce odours from glands, and there is much signalling, posturing, gentle rubbing and manoeuvring used to solicit or signal availability for mating, with additional sound effects. Such social displays are also found in many other reptiles, including chameleons, lizards, and turtles.

Part of our problem, when it comes to reptiles, is that we’re not very good at reading these social signals. We humans tend to miss the obvious cues, for example the partially raised, stiffened tail of a Komodo dragon, signalling irritation, or that the fearsome fellow is actually feeling threatened. Of course, some of these signals are subtle, some even use senses that we simply don’t possess. That said, as Harry Greene has argued, snakes have evolved a wide array of very obvious visual displays which, along with the ability to spit venom, are intended to fend off harassment by monkeys and primates, including even the dimmest of humans. Rattlesnakes rattle, saw-scaled vipers use their scales to ‘sizzle’, puff adders puff, cottonmouths have an open-mouth display, and of course cobras display their hoods. In the face of these well known cross-species communications, we can’t say we weren’t warned before a reluctant strike is made (and bites can be ‘dry’ bites meant to scare, not envenom). Of course, the problems arise when due to their camouflage, hiding, or being active at night, we trample snakes.

So, many reptiles are social animals, and as we’re constantly discovering (please go out and observe for yourself, there are many discoveries yet to be made) many reptiles including snakes are caring parents, notably pythons and pit vipers. Some rattlesnakes show a distinct fondness for sharing dens with family. All these



complex behaviours and social interactions prove that reptiles are neither simple nor primitive, and we should abandon the idea that animals that don't have brains like ours are unintelligent (think of all those clever "bird-brains").

As to emotions, we have barely scratched the surface. The internet is full of (hair-raising, for us 'experts') footage of people feeding and even stroking huge wild crocodiles. In Costa Rica, Gilberto 'Chito' Shedden became famous for his relationship with a large American crocodile he had rescued, who he named Pocho. Pocho would swim and play elaborate games with Gilberto, a relationship that lasted for 20 years until the crocodile died of old age. In the US, people can be seen travelling around with their 'comfort' alligators. Play has been observed in crocodylians and turtles, but much remains to be learnt about this.

Coexisting with reptiles

I have discussed reptilian capacities and behaviour at some length in order to demonstrate that they are quite capable of complex social interactions, and there is evidence that this extends across species barriers, too. So, what do I mean by "coexistence"? In the first instance, I refer you to my previous article in *Current Conservation*, on coexistence with crocodiles in the wetlands of Gujarat (see Issue 15.1). To summarise, I am referring to the free-willed choice to cohabit landscapes and share certain resources with other species. This involves knowingly taking certain actions and avoiding others, which inflict costs on the persons or animals so acting, to enable coexistence and avoid, where possible, negative interactions (co-adaptation). Notice that in the stories included in this special issue, coexistence has developed out of the relations between local communities and their reptilian neighbours. It is not imposed by external authorities — this would be tolerance, not coexistence.

Finally, it is important that these stories are honest about the high costs of coexisting with potentially dangerous animals. Jan van de Ploeg, for example,

begins his tale of coexistence with saltwater crocodiles in the Solomon Islands with a list of victims of crocodile attacks. All of the authors acknowledge the damage these species can inflict. But these communities have found ways of coexisting with them to varying degrees. This includes cultural beliefs informing human behaviour around these animals, along with indigenous knowledge about animal behaviour, all contributing to the possibility of sharing landscapes. Things do go wrong, sometimes tragically, and conservationists aiming to foster coexistence with dangerous animals must never forget this, as I have argued elsewhere. But this needn't be framed as conflict — coexistence doesn't require the absence of negative interactions to persist, it requires a socially acceptable approach to how to respond when things go wrong.

As Harry Greene and Marty Crump have shown, human (and primate) responses to reptiles are actually very diverse. I hope these stories inspire you to think again about the possibilities for human-reptile interactions. To consider what we may learn from particular stories of coexistence, while acknowledging the diversity of ways of coexisting with wildlife.

Fostering coexistence requires us to recognise it where it already exists, and resist interfering with this, or perhaps help mitigate against outside forces undermining it. It includes fostering coexistence where it does not exist. There is a role for snake catchers that enables those who wish to avoid killing a king cobra that has entered their home to choose a non-lethal response. There is a role for those explaining the ecological importance and benefit to humans of snakes in catching rodents that eat crops.

I hope some of you will support these kinds of efforts, and consider what we might learn from the *Ata Modo* of Komodo Island, villagers from the Malnad and Burdwan districts in India, the farmers of Cagayan Valley in the Philippines, fisherfolk from East Timor and the Solomon Islands, and the urban volunteers of Vadodara.

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Sharing a pond with Grandfather Crocodile

Author **Sebastian Brackhane** | Illustrator **Amogh Bhatnagar**



The Timorese creation myth is about a boy who found a young crocodile stranded on the coast in a far away place. The boy helped the weak crocodile and carried him back to the sea. The grateful crocodile promised the boy to help him and a few years later, the boy called the crocodile, by now fully grown, to travel the world

on its back. After travelling the oceans for years, the crocodile told the boy that it soon had to die. “I will turn my body into a beautiful island for you and your descendants,” said the crocodile, and after it died, its body grew and today the ridged back of the crocodile forms the island of Timor.

Timor-Leste's creation myth ‘*Lafaek Diak*’ (The Good Crocodile) is still omnipresent in the small Southeast Asian country, located approximately 500 km north of Australia and sharing the island Timor with its Indonesian counterpart West Timor, where similar spiritual attitudes towards crocodiles exist. The Timorese call their crocodiles ‘*Avo Lafaek*’ or Grandfather Crocodile.

The crocodile species that inhabits the island is the salt-water crocodile (*Crocodylus porosus*)—the largest and, together with the Nile crocodile, most dangerous of the world’s crocodilian species. Crocodiles were hunted for their skin during the times of Portuguese colonisation and Indonesian occupation. The colonial times not only had an impact on the country's saltwater crocodile population, but also on the spiritual life of the Timorese. Today, most Timorese are Catholics, after nearly 400 years of Portuguese colonisation and missionary work. So, how could these animistic beliefs survive and what does it mean for the coexistence of humans and crocodiles in the country?

The person most able to answer the first question is Josh Trindade, Timor-Leste's only anthropologist, who studied the local traditions and cultural beliefs in the country for more than two decades. “The Timorese belief system is called *lulik*. *Lulik* can be translated as ‘forbidden’, ‘holy’ or ‘sacred’ and refers to the spiritual cosmos that contains the divine creator, the spirits of the ancestors, and the spiritual root of life, including sacred rules and regulations that dictate relationships between people and people and nature,” Josh explains. “The *lulik* cosmos is not exclusive but rather adaptive—new values can be integrated.” So, the Timorese simply integrated Catholicism into their *lulik* cosmology, without relinquishing their traditional, more animistic beliefs. Today, ceremonies for the grandfather crocodile can be conducted on a Saturday with the same people attending a Catholic liturgy the very next day.

To answer the second question, I have to dive deeper into the sphere of human-crocodile interactions among the coastal local communities. Together with Mr. Flaminio Xavier, the Head of the Timorese Crocodile Task Force, I travel to the districts in the east and south of the country where most crocodiles

reside and where cultural beliefs are most pronounced. I learn about traditional elders who can communicate with local crocodiles. The ‘*Nain Lafaek*’ or the one who owns the crocodile, conducts ceremonies to enable safe travel for local fishermen. “When he calls, his local crocodile swims to him. Grandfather crocodiles hide when foreigners appear, so they could not be hunted during the times of occupation,” I am told. Ceremonies and rituals to worship and soothe the grandfather crocodile are held in traditional houses, the so-called *Uma Lulik*. During floods, the grandfather crocodiles protect the *Uma Lulik*, a local fisherman tells me. If a crocodile gets hurt, the whole village can be punished, for example by an earthquake.

The Timorese attitudes towards crocodiles, at least among many local communities, are characterised by respect, fear and tolerance. Killing a local grandfather crocodile is rarely permitted, even if the crocodile has attacked a human. Victims of crocodile attacks are often believed to have been punished for criminal acts against nature—the grandfather crocodile is seen in the light of a divine judge that cannot fail. Thus, crocodile attacks on humans are often tolerated as a circumstance of life. Assigning such a strong cultural, sacred status to crocodi-





les is perhaps the strongest protection measure for the species in Timor-Leste. Nevertheless, the belief system *lulik* is also used to prevent crocodile attacks, for example by declaring a local lagoon taboo for fishing. In summary, the *lulik* belief system dictates the human-crocodile interactions in Timor-Leste and enables the coexistence of crocodiles and local people.

In the past, during times of colonisation and occupation, crocodile numbers were low due to hunting pressure by the foreign powers. Local community members had special relationships with territorial crocodiles in local lagoons, rivers and lakes. The relationship was probably manifested by feeding these crocodiles. Local community members and local crocodiles could coexist in the same habitat without major negative interactions unacceptable to community members.

However, this coexistence has been interrupted since 2007 by an uptick in the number of crocodile attacks on humans, reaching a level unacceptable even to the local people that worship the species. Since Timor-Leste became independent in 2002 and crocodiles came under protection, the crocodile population has been increasing and so is the number of attacks on humans. But local communities do not blame the grandfather crocodile for the escalating human-crocodile conflict

in Timor-Leste. They say that troublemaker crocodiles are the reason for attacks on humans and the “stealing” of livestock. A traditional elder says that these troublemaker crocodiles are migrants from elsewhere, sent to steal and create turmoil.

Human-crocodile interactions have shifted from coexistence to conflict in many coastal communities in Timor-Leste, and new strategies are needed to bring the system back into balance. “Why don’t we catch the troublemaker crocodiles and put them into an enclosure? We can teach our people and foreigners about crocodiles there,” a village headman suggests. Perhaps not a bad idea. For sure, crocodile tourism could be one option in the country that was created by a crocodile.

Sebastian Brackhane researches human-crocodile interactions in Timor-Leste since 2014. He is an associated scientist with the Leibniz Institute for the Analysis of Biodiversity Change.

Amogh Bhatnagar is a graphic designer and visual artist. He typesets books, makes editorial illustrations and works on visual identities, and enjoys cooking and reading.

Urban crocs:

The case of muggers in Vadodara

Author **Raju Vyas** | Illustrator **Hitesh Maruti Sonar**

Rivers have served as lifelines throughout human history. Over thousands of years, civilisations have flourished and perished along the banks of different rivers across continents. Few terrestrial life forms can survive or thrive without access to clean freshwater. However, in the Anthropocene, humans continue to act oblivious to all the lessons from our history. Today, we find ourselves in this detrimentally extractive state of existence, where rivers are subjected to continuous contamination, irreversible damage, and steady degeneration.

We share this planet with millions of life forms, all of which deserve a chance to survive, grow, and live a peaceful life. As a result of our anthropocentric view of growth and development cultivated over the centuries, however, we have disturbed the order and balance of nature, exacerbating the loss of biodiversity.

On this note, I present an anecdote about the Vishwamitri River. Vishwamitri is a small non-perennial river, about 200 km in length. Located in the westernmost state of India, Gujarat, this rain-fed river originates in the Pavagadh hills and flows west to meet the Gulf of Khambhat. In between, Vishwamitri flows through a densely populated urban centre, the city of Vadodara. And within this city and its surroundings lie urban pockets which are home to more than 300 marsh crocodiles (*Crocodylus palustris*) or muggers. As a resident of Vadodara for nearly four decades, I present this emblematic account of the existence between humans and muggers based on first-hand observations and experiences.

Transformation of the Banyan City

Vadodara was once the capital of the princely state of Gaekwads, later anglicised as Baroda during the colonial era. Before the Gaekwads, Vadodara was known as Chandravati under the reign of Chanda of the Dodiya Rajput dynasty. Historically, the city was renamed from time to time, with





shifts in power and control. After independence from the British in 1947, it came to be known by its current name: Vadodara or the Banyan City.

With rapid urbanisation and industrialisation, the demographics of Vadodara changed faster than ever. As Vadodara continued to grow as an urban centre, the demand for housing and land grew exceedingly. This demand and the institutionalisation of the real estate industry was subsequently translated into a large-scale deforestation drive. The groves of banyan trees (*Ficus bengalensis*), which once reflected Vadodara's identity, were lost. Within a few decades, most of the banyan groves and pockets of wilderness disappeared. Similar to the fate of other contemporary cities, the quest for cosmopolitanism and a modern identity resulted in a near-complete erasure of Vadodara's heritage and unique identity.

Vadodara embraced its new identity as an industrial and student city. Alongside industries followed tech parks and the suburbs. It saw a steady rise in the influx of diverse settlers from near and far. Once a beautiful cultural capital and Gaekwad's legacy, the city became a bustling metropolis, imitating global trends and chasing development.

Changing ecology

The Vishwamitri River changes as it travels from the rural to the suburban and urban landscapes. The parts of Vishwamitri that cut across the city have murky, black, frothy waters polluted with industrial and medical waste and debris. Along with its appearance, the river's ecology changes unrecognisably. The calm waters of the river become muddy, erratic and problematic. The depths are artificially manipulated as and where needs arise.

Monsoon, historically romanticised and cherished, has become a nightmare for the citizens, to the extent that the municipal corporation has to survey and repair the entire city at the end of every season. A few inches of rain quickly flood most of the city and almost all the suburbs. The river goes from being the harbinger of life to a dreadful force of nature. The same riverside that defines the architecture and approach to all of the city's historical monuments now falls in the most overlooked

flood zones. Citywide evacuations, rescues, and rehabilitation occur invariably, testing the resilience of Vadodara's residents.

The data maintained by the local Forest Department shows alarming numbers of wildlife rescues, including snakes and marsh crocodiles, from human settlement areas every year. Additionally, more than a hundred volunteers from over half a dozen civil society organisations provide wildlife rescue services round the clock. According to the official data, over a thousand snakes and six dozen different-sized muggers are rescued annually.

The Banyan City now identifies with an abundance of muggers. As the apex predators of freshwater ecosystems, muggers have adapted to urbanisation, predominantly scavenging and feeding on carcasses. Alongside the disappearance of riverine habitat and scrub forests, the natural habitat of scavengers such as golden jackals (*Canis aureus*) and white-rumped vultures (*Gyps bengalensis*) also disappeared from the city. Thus, with scavengers becoming locally extinct, the muggers serve an important function by picking dead matter off the river banks.

Cohabitation, conflict and coexistence

Muggers have been cleaning up the river over the last three decades. As a result, the urban population of muggers has been growing steadily. And with cohabitation has come territorial tension between humans and muggers, each reclaiming their habitats and place in the city. While humans dominate the lands, muggers maintain control over the waters. In Vadodara, this interspecies tug-of-war is now commonplace.

Human-crocodile interactions have increased, resulting in frequent encounters and occasional conflicts. In 2021 and 2022, there were 344 mugger rescues, nine non-fatal mugger attacks on people, 15 dead muggers found where cause of death was unknown, and five muggers

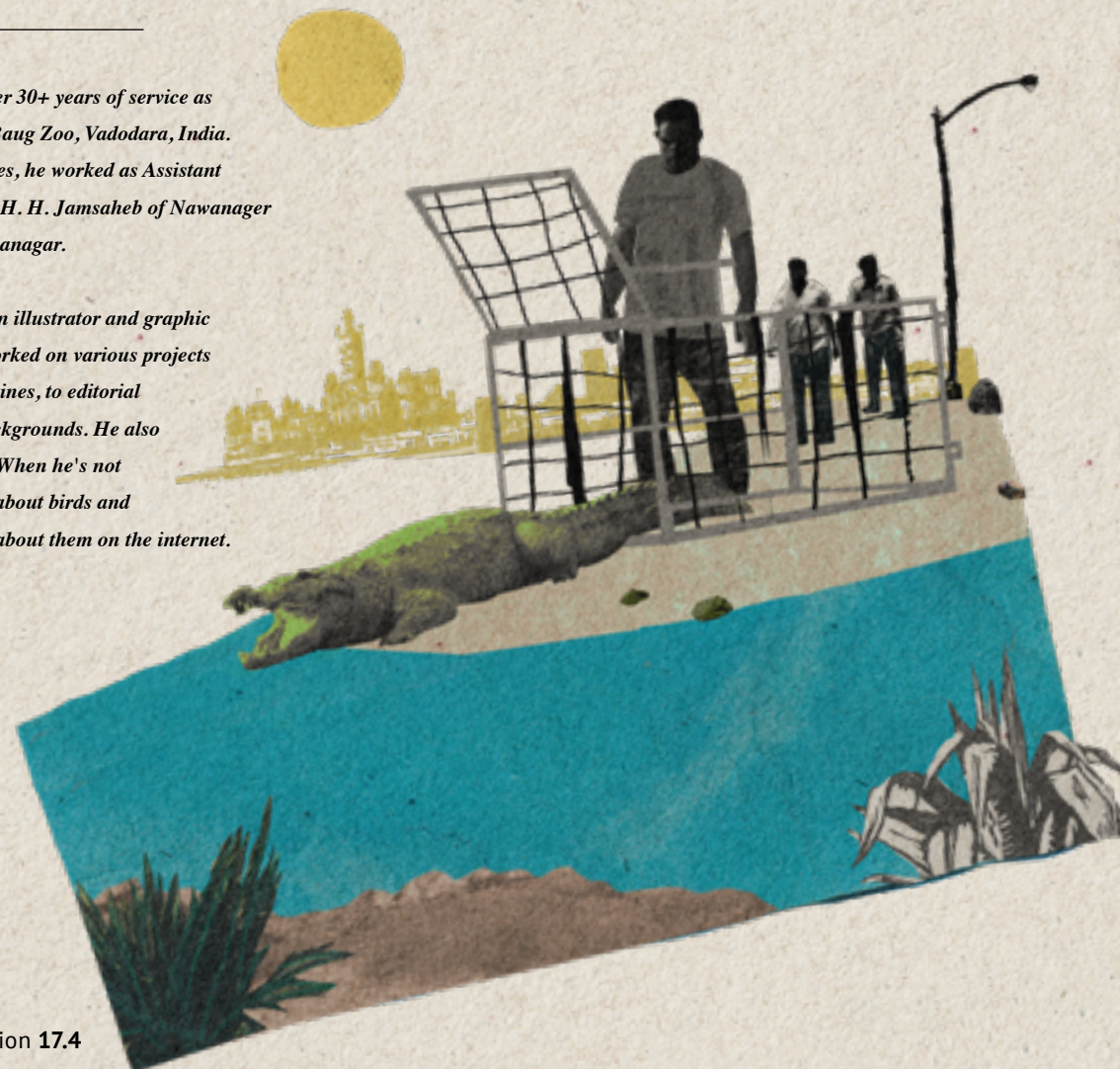
killed by vehicular traffic. Sometimes, humans suffer, and other times muggers.

We cannot overlook or dismiss the current reality where the existing harmony between Barodians and muggers is occasionally interrupted, leading to a dilemma and uncertainty. There have been records of muggers attacks where people lost their lives. If not fatal, there are several cases where the victims were left with a permanent disability. There have been instances of people seeking revenge by injuring or killing the crocodiles, or destroying their nests and habitats. Such attitudes and incidents pose a perpetual threat to the delicate coexistence of humans and wild-life in dense urban environments, and remains a challenge for urban wildlife conservation.

Despite these challenges, the term Barodians has come to include both humans and muggers cohabiting in the city. Thus Vadodara, once the Banyan City, may now be better described as the 'Mugger City'.

Raju Vyas is now retired after 30+ years of service as a Zoo Inspector, at the Sayaji Baug Zoo, Vadodara, India. Prior to this, in the early eighties, he worked as Assistant Curator with the private zoo of H. H. Jamsaheb of Nawanagar and The Peter Scott Trust, Jamanagar.

Hitesh Maruti Sonar is an illustrator and graphic artist from Mumbai. He has worked on various projects from book illustrations, magazines, to editorial illustrations and animation backgrounds. He also has deep admiration for birds. When he's not illustrating, he enjoys reading about birds and searching for interesting facts about them on the internet.



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Venomous Gods

Author **Janaki Lenin**
Illustrator **Mithra K**

“We haven’t used the bathroom for three days,” said the man apologetically in Kannada on the phone. No medical problem prevented his family from using the room. They had a different issue—a king cobra had moved in. They were now desperate to regain use of the room.

As in any traditional Malnad house, a concrete lip of single brick thickness demarcated the square bathing area in one corner of the room. The family and neighbours crowded the doorway. As the snake catchers’

eyes adjusted to the dim light, they saw the black snake coiled on the red floor. Golden yellow lines encircled its body at regular intervals like nodes on a bamboo culm. A gunny sack lay nearby.

“The cement is chipped there,” the lady of the household in Agumbe explained. “We were worried the snake may hurt itself crawling over the rough edge.” As the catchers debated

the plan of action, the family wanted repeated assurances that no harm would befall the king cobra, a revered being.

“If there’s any chance that it will get injured, please don’t catch it,” said the husband. Not only was the cost of performing a *puja* of repentance prohibitive, but clobbering it to death would be unthinkable. King cobras, in this part of the world, are worshipped as a god.

The family members had left the bathroom door ajar so the king cobra could find its way out on its own. When it showed no signs of taking the hint, neighbours convinced them to call the Agumbe Rainforest Research Station for help. During those three days, the snake could have reached up over the wall, crawled along the rafters, and entered any other room.

What kind of family stops using the bathroom for days, prevents a wild snake from hurting itself, and sleeps in the same house with it? The creature they fussed over was no piddling little thing. At 10-feet long, it was a member of the world’s largest venomous snake species.

King cobras, like the proverbial camel in the Arab’s tent, take full advantage of the benevolent Malnad farmers by holing up in bathrooms, beneath beds, and on roofs. Occasionally, they even attempt to stow away in automobiles.

Not everyone in Agumbe shares the same religious beliefs and they can be hostile to snakes. The majority, however, recognise king cobras for what they are—intelligent giants unwilling to waste their golden venom on inedible morsels like us. King cobras bite so few people, not counting inept rescuers, that one has to dig through the archives to find the last case. The team of snake rescuers at the research station have, over the past decade, made people realise that there’s another reason to leave the snakes alone: they perform a valuable service, readily gobbling up smaller snakes like vipers and cobras that kill thousands of people.

Such an attitude is not common in other parts of Karnataka, or in Indian states such as Andhra Pradesh and Mizoram, and elsewhere in the species’ Asian range,

where any king cobra that shows itself to humans is as good as dead. While the relationship between king cobras and the residents of Agumbe is no doubt special, is it possible, or even sensible, for people to share a similar bond with regular cobras which cause mass fatalities?

Across the country, Indians worship cobras. Our temple iconography shows these reptiles as the ornaments of Shiva and Ganesha, the bed of Vishnu, and the umbrella of Buddha. In several parts of the country, the devout sanctify termite hills as the abodes of these sacred snakes. Besides being objects of veneration, cobras serve a useful purpose around houses and farms: eating rodents. But their pest control assistance is overshadowed by their ability to kill. It’s no surprise that many people look for quick ways of despatching them from this world.

Basavanna, a poet-saint from 12th-century Karnataka, captured our conflicted feelings towards snakes thus: *When they see a serpent carved in stone, they pour milk on it, If a real serpent comes, they say, ‘Kill, kill’.* (*The Great Integrators: The Saint Singers of India*)

At the other end of the country, the residents of Boro Posla, Musharu, and a few other neighbouring villages in Burdwan District, West Bengal, however, have an entirely different outlook. Cobras have every reason to fear humans, and they are mainly creatures of the twilight hour. But here, they go about their business in broad daylight, foraging around houses and courtyards, while the human residents carry on with their own affairs, paying little attention to the reptiles. The unafraid cobras never spread a hood to display the startling eye-like marking.

The reason for these villagers’ apparent suicidal mindset is the presiding goddess Jhankeswari, after whom cobras get their local name, *jhanklai*. According to folklore, the deity won’t let the snakes harm her devotees and they don’t molest the reptiles. Everyone in the villages abides by this culture of getting along with one of the most dangerous serpents in the world.

Where even Agumbe’s inhabitants draw the line, these villagers are casual about the cobras. In the face of this sangfroid attitude, the snakes take great liberties, slithering through living rooms past children doing their homework, swallowing toads under beds, gobbling chicken eggs in coops, and sleeping among pots and pans in kitchens. The people neither call snake catchers to remove them nor do they drive the serpents out themselves. In fact, only the priest of the Jhankeswari temple is allowed to handle them. As the women cook and wash dishes, they talk to the *jhanklai* as if to their confidants. If the reptiles are in their way, they request them to move. If the deaf creatures fail to obey, they bang plates or buckets. More than the noise, the ladies’ sudden actions make the serpents move.

Lest this give the impression that these monocled cobras are harmless, in West Bengal state, nearly 43,000 victims died over 13 years from snakebite. Neither the spectacled nor the monocled cobra has the gravitas or the reputation for self-restraint that king cobras have.

The *jhanklai* do occasionally bite people. One lunged at a woman walking through her courtyard. But it was a ‘dry’ bite, as the snake didn’t inject any venom. In another case, a mouse fleeing a cobra dove under a gunny sack being used as a doormat. A three-year-old boy entered the room at that moment and the hunting snake bit his foot. He was treated in a hospital and bore the scar of tissue damage. Almost all the bites were feeding responses when hungry snakes mistook a human hand or foot for prey.



Despite the inconvenience of these mishaps, the villagers are convinced none will lose their lives to a cobra bite and continue to grant their *jhanklai* as much of a right to reside in their households as their families.

To the people of Agumbe and the villages of Burdwan who live with king cobras and cobras, the ecological and utilitarian arguments are irrelevant. They live by the foundational beliefs governing their worldview of mutual respect. Even though the king cobra had caused

discomfort and the snake catchers caught it with skill, that family prayed for forgiveness from the inconvenienced divinity. It has to be acknowledged that such reverence is selective. In both places, there is no tolerance for other species such as Russell's vipers.

Basavanna sang about the hypocrisy of the majority, but he neglected to sing paeans to his fellow countrymen who live by their convictions.

Although **Janaki Lenin** writes about and admires people's sanguine attitude towards dangerous animals, including venomous snakes, she doesn't think she has a similar disposition.

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Her practice primarily involves painting, extended by sculptural installations and strongly influenced by miniature painting styles.



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Living in harmony with dragons



Authors **Maria Rosdalima Panggur, Ayu Wijayanti, and Ardiantiono** | Illustrator **Labonie Roy**

"Ndadi manga waing di sa ro losa anaq rua. Pusi sa kenobo ndadi ora, sa kenobo ndadi manusia."

"On a fateful day, two children were born. One, an Ora (Komodo), and the other, a human."

— J. A. J. Verheijen

Human-wildlife coexistence entails recognising the importance of sharing our space with wildlife. Achieving a sustainable, lasting coexistence can be challenging, particularly when dealing with formidable predators that may pose risks to human safety. Yet, an extraordinary exception to this is found in Komodo village, located within Komodo National Park. In this community, people live in harmony with awe-inspiring Komodo dragons (*Varanus komodoensis*)—the world's largest and iconic lizard found only in Indonesia.

Komodo dragons are remarkable giants, reaching lengths of up to three metres and weighing as much as 100 kilograms. As the apex predator, they are capable of hunting down large prey species like deer, wild pig, horse, and even buffalo, using a stealthy wait-and-ambush tactic. Their bites are venomous and contain infectious bacteria, causing slow and agonising death for their prey. Komodo dragons are well protected in the Komodo National Park, which harbours approximately 70 percent of the global population, according to the IUCN Red List 2019 assessment. Their solitary and

cannibalistic nature, coupled with their remarkable sense of smell and the female's ability to give birth without mating, continues to captivate imaginations worldwide.

For centuries Komodo villagers, locally known as *Ata Modo*, have shared their lives with the dragons. According to a 2022 national park survey, around 50 percent of the park's Komodo population, equivalent to 1561 individuals, are concentrated on Komodo Island, where the *Ata Modo* reside. Encounters with these creatures are routine, when villagers venture into the forest or the dragons wander into the village. While such encounters are typically harmonious, there have been instances of negative interactions between *Ata Modo* and Komodo. The national park has recorded five cases of Komodo attacks on villagers since 2000 resulting in severe injuries or even fatalities. In addition, dragons have occasionally been reported to have preyed on villagers' livestock, primarily goats and chickens.

While interactions between people and the giant lizards in Komodo Village may not always be peaceful, they demonstrate a remarkable coexistence that has long endured. An example of this is the infrequent retaliation or condemna-





tion of the dragons when they attack people or livestock. This harmonious relationship is a result of several intertwined factors, including local beliefs and culture, economic benefits derived from tourism, and compliance with conservation regulations.

Historical connection

Komodo Village stands as a distinctive community that cherishes and preserves its rich history and traditions. Among the most profound beliefs held by *Ata Modo* is the notion that Komodo dragons are their own siblings, born from a common mother. This belief has been passed down across generations through oral storytelling, encapsulated in the enduring ‘Story of Sebae’, recounted below.

Long ago, a young couple named Hami and Epa celebrated the birth of twins. The boy was named Ndas, while his sister, Ora, bore a unique resemblance to a formidable lizard. They lived together in the village until a time when Epa decided that Ora’s appetite for rats and geckos brought shame upon their family and took her to the forest. As years passed, Ndas grew into a skilled fisherman, married, and started a family of his own. Meanwhile, Ora thrived in her forest, honing her hunting skills on deer, and raising her own offspring.

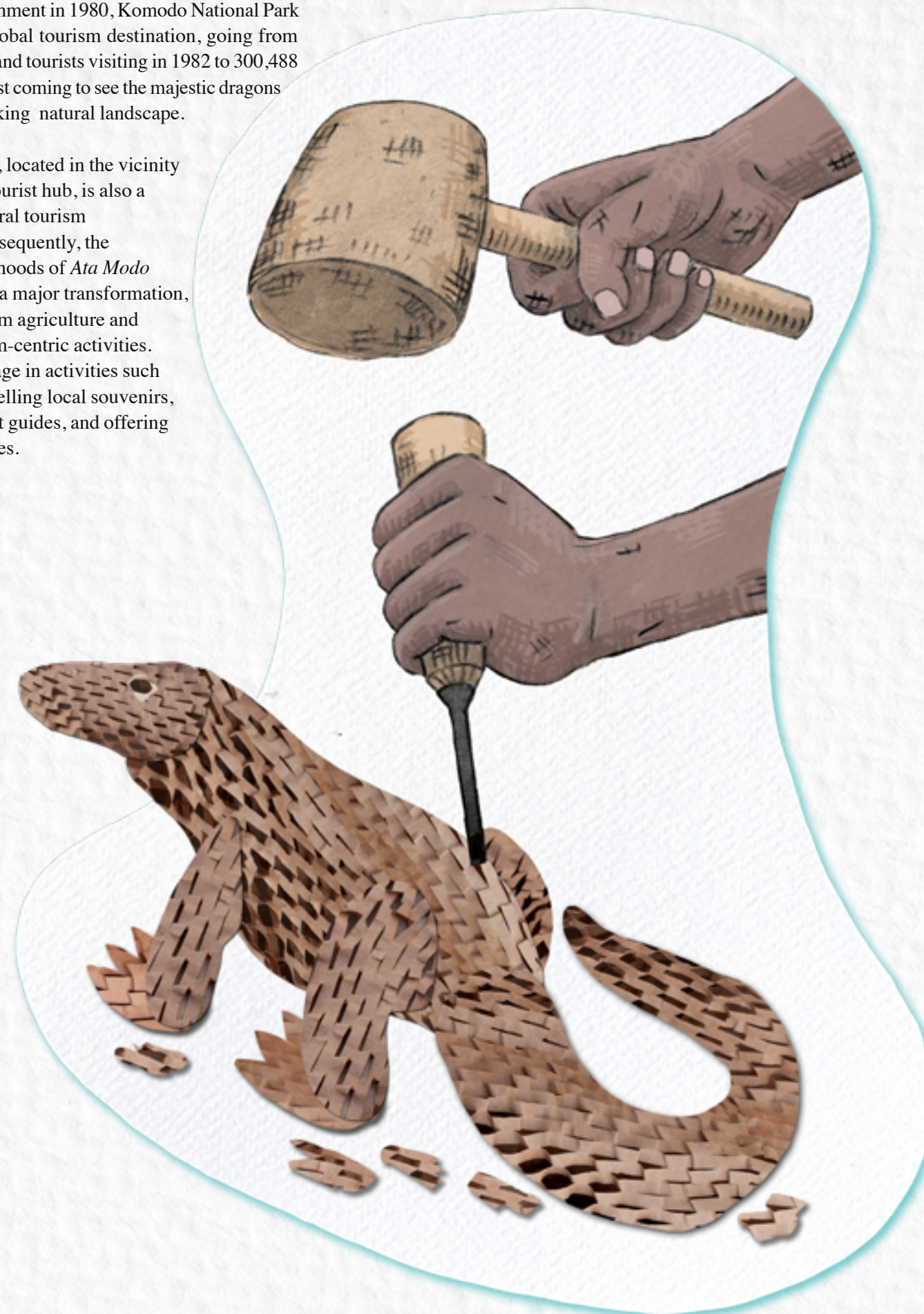
One fateful day, Ndas ventured into the forest in search of medicine for his child and got lost. He felt an unseen presence observing him and suddenly saw a massive lizard looming in the distance behind him, prompting both Ndas and Ora to prepare for confrontation. Fortunately, their mother appeared then. The elderly woman said, “Don’t harm each other because you are twins. I have been caring for Ora in this forest so she neither troubles nor is troubled by humans.” Ndas, enlightened by this revelation, returned to the village with his mother, vowing and asking others not to disturb Ora, as she was their sister or *Sebae*.

Dragon tourism

The dynamics of people’s relationship with Komodo have evolved due to the economic benefits of tourism.

Since its establishment in 1980, Komodo National Park has become a global tourism destination, going from less than a thousand tourists visiting in 1982 to 300,488 in 2023, with most coming to see the majestic dragons and the breathtaking natural landscape.

Komodo village, located in the vicinity of the primary tourist hub, is also a designated cultural tourism destination. Consequently, the traditional livelihoods of *Ata Modo* have undergone a major transformation, transitioning from agriculture and fishing to tourism-centric activities. Today, they engage in activities such as crafting and selling local souvenirs, serving as tourist guides, and offering homestay services.



The *Ata Modo* recognise the economic value that the Komodo dragons bring to their community and take immense pride in being known as people who live in harmony with these magnificent lizards.

Conservation compliance

The *Ata Modo*’s coexistence with Komodo dragons is also built on their deep understanding of the importance of protecting this species and adherence to conservation regulations. Formally safeguarded since the Dutch occupation and now fully protected by Indonesian law, the dragons were the principal reason for Komodo National Park’s establishment in 1980, which affected local communities within its boundary. Ever since, these communities have lived under regulations designed to preserve not only the dragons but also the broader wildlife and ecosystems.

To ensure compliance, the national park conducts regular awareness and tourism-related capacity building programs, such as craft-making and guiding. Routine patrols are employed to deter activities such as poaching and illegal logging within the park. These regulations may at times lead to local discontent, as they can feel marginalised and restricted in activities like fishing or wood collection. Despite occasional tensions, it is worth noting that the *Ata Modo* never blame Komodo dragons for their situation, as evidenced by a complete absence of reports of retaliation towards these creatures over the past 15 years.

Lessons from Komodo village

Although most *Ata Modo* naturally fear Komodo dragons due to their size and predatory nature, there has been a noticeable shift in how the villagers interact with the lizards, with more people now observed in close proximity to them. This shift has been influenced by the

growth of tourism, attracting visitors who want to observe the dragons up close, coupled with an increasing understanding of their behaviour.

For example, Komodo dragons that frequently encounter humans become habituated and can be approached closely, unlike wild dragons who typically flee or avoid humans. However, caution is needed in close encounters as they are wild animals and may exhibit aggression when disturbed or threatened. Therefore, it is important to interact with these creatures with the utmost respect for their personal space.

Long-term coexistence between humans and wildlife is the result of a complex interplay of multiple factors.

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Shared history has forged a deep and enduring bond between the *Ata Modo* and the dragons in Komodo village. In addition, tourism has brought economic benefits to local livelihoods, while their commitment to adhering to conservation regulations ensures positive interactions not only with the Komodo dragons, but also with the broader biodiversity and natural environment within the national park.

While the term “coexistence” might not be a familiar one to the *Ata Modo*, their way of life perfectly exemplifies what it means to harmoniously share space with wildlife. By observing their interactions with Komodo dragons, we can learn valuable lessons about our capacity to coexist with other species now and in the future.

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Human-crocodile coexistence in the Solomon Islands

Author **Jan van der Ploeg** | Painter **John Limaito**



On a late afternoon in 2016, Zevia was collecting shells with her grandmother in the mangroves behind the village when a crocodile suddenly pulled her underwater. Zevia fought the crocodile and somehow escaped, but she died two weeks later from the infected wounds on her legs and back. She was 13 years old.

Kyio, four years old, was bathing in the river when the crocodile bit him and dragged him to the deep. His sister hit the crocodile on the head and pulled the boy back, but it was too late. Saleani, nine years old, was playing with her friends when a crocodile pulled her underwater.

The village searched for two days before they found her body underwater, hidden under a tree. Cathyleen, nine, disappeared when she went to the riverbank early in the morning to defecate. Grinnet, 16, was pulled from her dugout canoe. Peterson, 13, drowned when he was bitten on his leg. Gumu, seven. Junior, nine. Martin, 14. Consi, 12. Don, six. The list is much longer.

Attacks are a growing challenge

In 2018, we conducted a survey throughout the Solomon Islands and recorded 83 fatal crocodile attacks on people, including 31 on children. We found out that every year, on average, five people are killed by saltwater crocodiles. Many other people are seriously injured and traumatised in crocodile attacks. We recorded 225 crocodile attacks over the past 20 years, 37 percent with a deadly outcome. Most crocodile attacks are on fishermen who dive at night on the reefs. But attacks on children typically result in higher fatality rates: in 63 percent of attacks, the victim did not survive the encounter. A major concern is that the number of

attacks on people has increased markedly over the past ten years, most likely the result of the recovery of the saltwater crocodile population.

The saltwater crocodile is a large predator, with some individuals measuring up to 6m and weighing more than a tonne. The species inhabits tidal rivers, freshwater lakes and mangrove forests, and occasionally forages on coral reefs. Saltwater crocodiles hunt a wide variety of animals, including people. Prey is typically ambushed in or at the edge of the water. Small animals are swallowed whole, large ones are dragged into deep water, drowned and then torn to pieces.

Commercial hunting and habitat loss has wiped out the species in most parts of its former range. But in areas with large undisturbed wetlands, such as Australia, Papua New Guinea and the Solomon Islands, saltwater crocodile populations recovered rapidly when trade in crocodile leather was banned. In these countries the species is a growing source of concern for rural communities.



Sacred reptile

Perhaps because of the ever-present danger saltwater crocodiles pose to people, the species plays a prominent cultural role in the Solomon Islands. Throughout the archipelago, there are customary restrictions on killing and eating crocodiles. In more than half of the 234 villages that we visited during the survey, people said that crocodiles were sacred animals. Some people see crocodiles as their totem animal, tracing their genealogy to a mythical crocodile ancestor. Others tell stories of spirit-crocodiles guarding tribal lands, women giving birth to crocodiles and chiefs talking to the reptiles. In many villages people respectfully talk about the grandmother-crocodile that inhabits the mangroves. In principle, these sacred crocodiles are benevolent creatures that help their human relatives in times of need. But the ancestors can also be vengeful, and punish people who violate customary rules and taboos. In many cases, a crocodile attack is attributed to sorcery, theft or adultery.

Conservationists tend to dismiss such animistic beliefs as primitive superstition, irrelevant for the modern world, and a constraint for effective saltwater crocodile management. They advocate setting up a crocodile leather industry in the Solomon Islands, following the Australian example where crocodile farming is a profitable industry. Sustainable use will generate monetary incentives for rural communities to tolerate crocodiles in the wild, or so is the hypothesis.

I disagree, and think that efforts to prevent human-crocodile conflicts in the Solomon Islands should be based on local knowledge and experiences. To be clear, I do not claim that people live in harmony with saltwater crocodiles. They don't. People fear crocodiles. Villagers are shocked and angry when a crocodile takes a life, and rigorously persecute the man-eaters after an attack. In most villages people trap crocodiles once they pose a threat to children and livestock.

Coexistence

Animistic beliefs and traditions are instrumental for coexistence on a more fundamental level. First, totems and taboos often offer practical guidelines to minimise the risk posed by a dangerous predator. The prohibition to enter sacred sites, which are in many cases areas



where saltwater crocodile nest, is an obvious example. Respecting crocodiles is another. Fishers have in-depth knowledge of crocodile ecology and behaviour, and take common sense precautionary measures to prevent attacks, such as avoiding murky water and deep pools where crocodiles hide.

Second, stories of ancestors, spirits and sorcerers give meaning to crocodile attacks. These beliefs rationalise traumatic events, and thereby help people to cope with pain and loss. Third, and perhaps most important, these cultural values enable people to accept risk and uncertainty. People acknowledge the danger posed by crocodiles, and are resigned to the possibility of a deadly encounter.

It is important not to confuse this acquiescence with apathy or ignorance. On the contrary, it is based on stark realism. In most cases there is simply no alternative: people need to fish, bathe and shit, also when and where there are crocodiles. Most of the time things go well. It is in fact surprising how relatively few crocodile attacks occur, given the number of people who go out every night in saltwater crocodile habitat to spearfish, gather

shells, wash or relieve themselves. Preventing crocodile attacks on humans, for example, by fencing bathing areas, would require investments that are infeasible and unrealistic. Rural communities in the Solomon Islands have to deal with a range of other problems that are undoubtedly more urgent. The sad reality is that many more children in the Solomon Islands die of diarrhoea, malaria, car accidents, and domestic violence than of crocodile attacks.

Relationships, respect and resignation

Efforts to minimise the risk posed by crocodiles in the Solomon Islands should, in my view, build on and reinforce indigenous knowledge and practices. After all, the folk stories, legends and myths reach far more people than any public awareness campaign ever can. Every child in the Solomon Islands knows very well that crocodiles are dangerous, and that caution is needed in the mangroves.

What makes the preoccupation with crocodile farming and leather trade so damaging, in my view, is that it contradicts the wisdom and worldview of people in the



Solomon Islands. The Western notion of human separation from, and dominance over, nature challenges the indigenous view of descent and kinship. The proposition to farm these supposedly soulless animals undermines respect for the living, animated world. The export of leather will not prevent crocodile attacks from happening, and the few dollars for a crocodile skin can never compensate the loss of a loved one. Such logic seems far more irrational than the belief that people and crocodiles are related.

To prevent saltwater crocodile attacks on humans it is much more effective to invest in basic rural development programs, particularly related to healthcare and sanitation. Ensuring that antibiotics and other medical supplies are available at rural health clinics could significantly reduce fatality rates. Perhaps this could have saved Zevia. Likewise, much can be gained if people are no longer obliged to defecate in mangroves, beaches or river banks at night, or to bathe in a murky river. Providing safe access to sanitation and clean water can minimise human-crocodile interactions, and obviously has much broader public health benefits. Perhaps Kyio would not have died.

It seems hard, perhaps impossible, to reconcile the loss of so many children with the aim to conserve saltwater crocodiles in the wild. The best answer is to rely on the cultural values and wisdom of people who live with these dangerous predators. Coexistence is not

about posters, fences or money, but about relationships, respect and resignation. Coexistence is, as the anthropologist Val Plumwood wrote after being attacked by a saltwater crocodile herself, about ‘being humble about our relationship with the Earth and about the need to acknowledge our vulnerability’.

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Culture, pride and coexistence with the Philippine crocodile

Authors **Merlijn van Weerd, Myrna Cureg, Marites Balbas**
& **Jan van der Ploeg** | Photographs by **Merlijn van Weerd & Jan van der Ploeg**

Jennifer Montanes-Gonzales lives in the small hamlet of Dunoy, situated along the Catallangan River on the island of Luzon, Philippines. “I often see crocodiles when I go bathing in the river with my children. They are always very excited when they see the crocodiles, and they are not scared of them,” she says.

Her father, Victorino Montanes, migrated here in the 1980s, seeking land to cultivate. In Cagayan Valley, land was getting scarce and expensive to buy. Victorino travelled east until he found uncultivated forestland near a river with abundant clear water. The only other people living here were Agta, the first Indigenous People of the Philippines. The Agta hunt, fish, and collect root crops. They live in small settlements, which they move every few months to another location.

Victorino agreed with them that he could build a house and clear a forest area for corn cultivation. The forest at that time still had abundant game, and the river provided fish. The Agta mentioned to Victorino that the river also harboured crocodiles, but that they were harmless if you did not harm them. Victorino was perhaps not so sure about that, but he accepted the crocodiles.

In 1999, a group of Dutch and Filipino scientists visited Victorino as they had heard from fishermen that crocodiles were regularly seen in the municipality of San Mariano, where Dunoy is located. Victorino led them to Dunoy Lake where they observed two adult crocodiles and 12 hatchlings. The researchers celebrated the find that evening together with Victorino and a bottle of gin. They had found a very small, but reproducing wild population of the Philippine crocodile—the rarest crocodile in the world.

A history of deteriorating relations

The Philippine crocodile (*Crocodylus mindorensis*) is a relatively small freshwater crocodilian (growing to a maximum length of 3m), found only in the Philippines. When the Spanish colonised the Philippines in 1565, they sent home reports with descriptions of the land and its people and wildlife. The Spanish were appalled by the fact that there were crocodiles seemingly everywhere. They were amazed that “the indios” both feared and venerated the



crocodiles. The Philippines in fact has two species of crocodiles: the endemic freshwater Philippine crocodile (*Crocodylus mindorensis*) and the much larger and potentially man-eating saltwater crocodile (*Crocodylus porosus*), which occurs from Australia to India. In most Philippine indigenous languages, there are different names for the two species, and different dangers are attributed to them.

For the Spanish priests though, all crocodiles were monsters that had to be extirpated. There is a mural in the Catholic church of San Mariano where Jesus the Saviour is shown protecting a human community in his hand, while stepping on a crocodile to keep evil under his feet. In 1898, the US took over from the Spanish as colonisers of the Philippines. Like the Spanish, Hollywood would portray crocodiles as evil creatures.

Nowadays in the Philippines, crocodiles are widely regarded as dangerous animals, regardless of the species. They are stereotyped as bloodthirsty monsters and are associated with greed. Corrupt government officials and selfish athletes are called *buwaya*, the Filipino word for crocodile. These negative attitudes towards crocodiles are seen as a major impediment to *in-situ* crocodile conservation in the Philippines by the government, and have led to removal of crocodiles from the wild into *ex-situ* facilities to safeguard crocodiles and protect local communities

Crocodiles in local culture

These negative attitudes towards crocodiles have not always been there, however, and also do not exist everywhere in the Philippines. Crocodiles continue to play an important role in folk stories, songs, and material culture, such as woven cloth and wood carvings. Throughout the Philippines, indigenous communities had intricate relations with crocodiles. In San Mariano, the Agta have personal bonds with individual crocodiles. Crocodiles and people can be friends and even blood brothers. Spear-fishermen often encounter crocodiles underwater, and do not fear them. They kindly ask the crocodile for permission to pass and to share the fish resources.

According to Nestor Alejo, an Agta elder residing in Dunoy: “What the Agta believe is that the crocodiles are helping us. We see that the crocodiles guard our rivers.” The Kalinga, another indigenous group in San Mariano, pray to crocodiles and provide offerings. They believe that crocodiles are the embodiment of their ancestors, that some people have the power to change into crocodiles and that others are born with a spiritual crocodile twin. There is a strong taboo against killing crocodiles.

Both the Agta and Kalinga do not dispute that crocodiles are potentially dangerous, especially large saltwater crocodiles. But if the crocodile does something to you, then you have probably deserved that because you did something wrong. This strong belief that a crocodile will not harm you if you do not harm the

crocodile, has shaped the relationship that indigenous communities have with crocodiles until this day in the few areas where crocodiles still occur in the Philippines. But what about people like Victorino, who is an Ilocano migrant to San Mariano, and whose parents did not teach him to pay respect to crocodiles?

Victorino was not the only farmer who discovered the potential of San Mariano for land. Since the 1960s, when vast forest areas of San Mariano were opened up by commercial logging operations, immigrant farmers started to come in. They settled along rivers to transport their produce, since roads did not exist, and often observed crocodiles in those rivers.



Boy Robles, one of the first settlers along Dinang Creek—which remains an important breeding area of the Philippine crocodile—recounts: “When I first arrived here, it was all forest. There were no roads, only narrow footpaths. There were lots of wild animals, such as wild chicken, wild pig and wild deer. But nowadays there is no abundant food for crocodiles because there are no wild deer and wild pigs anymore. This is the reason why crocodiles eat our livestock.” In addition to negative perceptions, conflicts over livestock predation is one of the reasons that immigrant farmers kill crocodiles in San Mariano.

Mabuhay buwaya

Since 2003, the Mabuwaya Foundation (*mabuhay* = long live, *buwaya* = crocodile), in collaboration with Isabela State University, has been implementing a research and conservation program for the Philippine crocodile in San Mariano. A key component of this program is a long-term Communication, Education and Public Awareness (CEPA) strategy. While recognising the importance and relevance of indigenous belief systems that enabled people to coexist with crocodiles in San Mariano, younger people and immigrant farmers do not necessarily believe in crocodiles as ancestors, twins or forest spirits.

Therefore, the Mabuwaya Foundation tries to instil new forms of respect for crocodiles. These are based on the sense of pride in harbouring have the last individuals of this Philippine endemic species in the local rivers and refer to the general responsibility to take care of the environment and the species within it. The key message of the program is: “The Philippine crocodile, something to be proud of!” The program also promotes conditions that facilitate coexistence with crocodiles: crocodile wetlands and buffer zones are protected and rehabilitated to provide natural prey species and nesting habitat for crocodiles, and farmers are assisted with building pig and chicken pens to avoid livestock predation.

The CEPA program has led to acceptance of the crocodiles by more than 80 percent of a representative group of respondents in San Mariano. Today, there are eight community-managed crocodile sanctuaries. Community members, including children, are involved in crocodile monitoring and releasing headstarted crocodiles back into the wild (this is a conservation technique where young animals are raised ex-situ to increase their chances of survival to adulthood). A Philippine crocodile festival in 2018 in San Mariano, where schools competed to come up with the most spectacular crocodile dance in crocodile costumes, drew 35,000 visitors.

The crocodile population has grown from approximately 20 in 1999 to nearly 100 individuals in 2023 and the distribution of the crocodiles increased from three to eight distinct wetland areas. In 2023, six community-protected nests in four different sites successfully hatched. Livestock predation by crocodiles has greatly diminished as a result of rehabilitated riparian buffer zones and livestock protection measures. The deliberate killing of crocodiles still occasionally occurs but leads to outrage and action by community members and local government officials. Although there are a few visitors every year to see the wild Philippine crocodiles of San Mariano, there is no large-scale ecotourism program here that provides a financial incentive to communities that protect their crocodiles. Pride and respect are the main reasons why farmers like Victorino Montanes now accept the crocodiles in their midst.

Jennifer Montanes-Gonzalez says about the importance of crocodile conservation: “If there were no more crocodiles left, I would be very sad because by protecting the crocodiles we are protecting the rivers.” The current basis of coexistence of people and Philippine crocodiles in San Mariano is perhaps different compared to the indigenous belief systems, but it shares a widespread conviction that crocodiles have a right to live in the same rivers that are used by people and that crocodiles are not dangerous if people respect them. *Mabuhay buwaya!*



Further Reading

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Jan van der Ploeg is a Dutch anthropologist. In 2003 he co-founded the Mabuwaya Foundation.



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