

## HOW TO IMPROVE THE TURTLE PROTECTION IN SRI LANKA AND MAKE IT MORE EFFICIENT

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**ABSTRACT :** Sea turtle hatcheries in Sri Lanka as a starting point play an important role in the successful protection of sea turtles. The aim of the research was to monitor and evaluate the protection of sea turtle and the effort to raise awareness about their protection. The data was collected in 2019 at conservation centers in Sri Lanka in cooperation of the Department of Wildlife Conservation, Sri Lanka. The resorts were visited without prior notice; the evaluation was completed on the basis of specific criteria. During the monitoring and evaluation of sea turtle conservation centers in Sri Lanka, the breeding of healthy turtles in pools was observed for more than 24 hours in 12 of the 15 resorts. Our mission is to help conservation centers develop effective conservation methods and ensure a stable population of sea turtles in Sri Lanka. An implementation and gradual small changes will have an effective impact on the ecosystem, raising awareness among local people, conservationists and tourists and enabling them to understand the cause of the critically endangered reptiles as well as the basis for their effective protection.

**KEY WORDS:** effective conservation, Sri Lanka, turtle hatcheries, turtle protection

### INTRODUCTION

Sea turtles are highly migratory, geographically widespread animals and therefore require trans-boundary conservation strategies. According to the International Union for Conservation of Nature (IUCN, 2019) approximately 62.8% of sea turtle populations suffer a certain degree of threat, of which 19.4% are classified as critically threatened, 17.4% as threatened and 30% as vulnerable (Gibbons *et al.*, 2000). In spite of this, many countries still slaughter turtles for food and their nests are robbed (Troëng and Rankin, 2005). This is happening in Sri Lanka, where 5 species of turtle are located: the green sea turtle (*Chelonia mydas*), the olive ridley (*Lepidochelys olivacea*), the leatherback turtle (*Dermochelys coriacea*), the hawksbill turtle (*Eretmochelys imbricata*) and the loggerhead sea turtle (*Caretta caretta*) (Jayathilaka *et al.*, 2017).

Conservation efforts to better protect sea turtles, conservationist centers have been developed, but these only work as a starting point (Pilcher and Enderby, 2001). Hatchlings are raised in the pools in these centers until they are strong enough to survive their predators. Unfortunately, this method is not ideal because 48 hours after hatching, the babies lose their instincts, such as orientation and migration in the ocean and return to their native territories for nesting (Tisdell and Wilson, 2005). In consequence, conservatory pools are shallow, the turtles can not dive deep and without waves, animals do not have to overcome the pressure, causing lung atrophy (Turtle Foundation, 2013). In Sri Lanka the conservation centers are built to attract tourists and allow them to see turtles 24 hours per day. Surveys among the tourists suggest that they would rather to see effective protection of sea turtles, which means either to be present when hatchlings are released into the sea or to watch the female during nesting.

The project aims to ensure the stability of the sea turtle population in Sri Lanka in the context of caring for and inspiring local people for the surrounding ecosystem and nature conservation in general. We would like to raise awareness among local people, conservationists and tourists to understand the root cause of these critically endangered reptiles and the basics of their effective protection. The aim is to ensure that marine turtle conservation centers effectively protect and, above all, serve as an education center.

### ***The Current Situation***

Sea turtles are a unique ancient group of reptiles fully adapted to living in the ocean and are an irreplaceable part of marine ecosystems. They are solitary creatures that spend most of their lives submerged and migrate thousands of miles between their foraging and mating grounds. They reach ashore only during the time of nesting, when females lay eggs on the same beach where they were once born. Sea turtles have evolved millions of years before humans and have almost no natural enemies in the animal kingdom (Jayathilaka *et al.*, 2017). Human action has reduced the population of some species by 80% over the last 100 years.

The conservation of these populations is essential because of their ecological role in the oceanic community. For example, hawksbill sea turtle eat sponges on coral reefs and thus contribute to the preservation of this ecosystem. Coral reefs serve as a shelter for many species of sea creatures from predators (Witzell, 1983; Spotila, 2004). Within the organic chain, commercially important fish species, such as yellowfin tuna and skipjack tuna are consumed, accounting for the largest share of total commercial fisheries in Sri Lanka. It follows that, conservation of hawksbills has a positive impact on the local economy. In addition to hawksbills, four other species of sea turtles worth conserving make Sri Lanka their home. These include the leatherback sea turtle, which eats jellyfish and thus regulates their populations. Green sea turtles feed on seagrass and assist seagrass dispersal to the new areas (Spotila, 2004). They are responsible

for creating of seagrass meadows, where small species of fish can find shelter (Heaslip *et al.*, 2012). However, all five species of sea turtles are on the verge of extinction. Conservation centers make a significant contribution to the protection of sea turtle as they can focus on protecting egg clutches from predators and poachers (Witherington, 1986) and, as a result, increase turtle chances to survive. To ensure these goals are met, their practices should correspond with findings about sea turtles' needs and habits and should be adapted to the specific needs of each species.

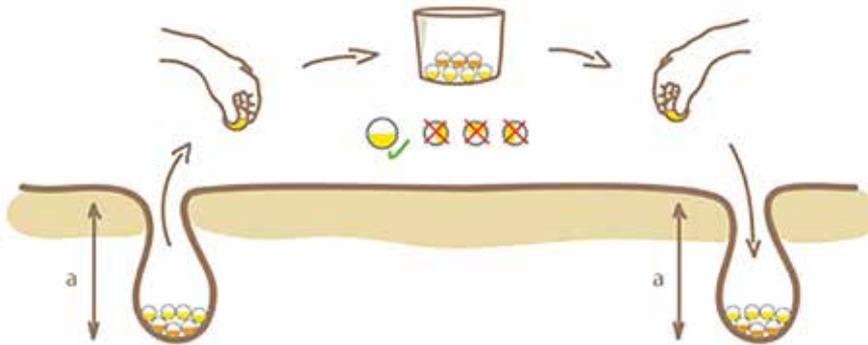
### ***Effective Conservation***

#### ***Eggs***

Turtle eggs may be laid in an unsuitable place, where they are endangered by predators, humans (Troëng and Rankin, 2005) or by floods (Milton *et al.*, 1994; Poloczanska *et al.*, 2009) during high tide. In such cases, the eggs must be moved to a safe place on the beach where humans and predators can not reach them. Clutches should be moved on the same night the female has laid the eggs, as during the first two hours an embryo starts to develop within the egg, which is damaged by any swift movement. For the same reason eggs should not be turned during relocation (Figure 1) (Wyneken *et al.*, 1998). We can ensure this by placing them in a bucket with a bit of sand, which fixes them in place.

The eggs should be relocated if:

- predators or humans can reach the clutch
- the clutch is too close to the sea and there is risk of flooding the eggs and suffocation of the embryos (Carpio *et al.*, 2020)
- the clutch is located near a tourist beach, which causes the hatchlings to follow lights, such as street lamps or lights from hotels, away from the ocean, instead of heading towards the horizon (Salmon, 2003; Lorne and Salmon, 2007)
- the beach is covered with waste or other obstacles, which will complicate the hatchlings crawl to the sea (Salmon and Witherington, 2005).



**FIGURE 01 :** Effective method of moving eggs.

Beaches need to be kept clean, as plastic waste, litter and other barriers will slow the hatchlings down. This may prevent them from crawling to the sea in time, e.g. before they run out of energy supply from the yolk sac or before they are preyed upon (Booth, 2004). Eggs should never be purchased from local people, because the buyers never know where they come from and what condition they are in. Such practices may support and even promote robbing of the nests.

**Incubation**

Clutches should be relocated to a fenced area on the beach, where neither humans nor predators can reach them. These areas should be covered with a protective net. Nests should be located at least 0.5 meters from each other and they should be placed in the same depth as they originally were. Sufficient distance prevents infection by bacteria adjacent nests (Wyncken *et al.*, 1998). All clutches should be labeled with the date of nesting. The nesting area should be partially shaded (Figure 2), to ensure diversity of the clutches, because the temperature of the nest influences the sex of the hatchlings (Lutz *et al.*, 2002; Kobayashi *et al.*, 2017).



**FIGURE 02 :** An example of effective protective area.

### ***Hatchlings and Pools***

All hatchlings must be released to the sea no later than 24 hours after their emerging. This must be done in the evening or early morning when the sand is cool. Hot sand can damage their yolk sack or the hatchling itself could overheat. Hatchlings have to be released to different places on the beach, because when a large group is released, it attracts predators (Hewavisenthi, 2001).

With each hour that the hatchlings are not released into the sea, the chances of their survival decrease. In the pools of a conservation center the hatchlings are not able to dive low enough and their lungs are not developing properly. Some muscles may become atrophied. These muscles are important for survival in the ocean, where turtles migrate thousands of miles. Hatchlings kept in pools show less activity and their swimming is less efficient. After 48 hours the hatchlings lose their instinct to return, i.e. where is their birth beach and where should they return once they reach maturity (Tisdell and Wilson, 2003; Lohmann *et al.*, 2009). The release of these hatchlings can have terrible consequences – they never have to adapt to their natural habitat. Hatchlings lose their natural instinct to obtain food because they have been fed manually for so long (Owens *et al.*, 1982; Wyneken *et al.*, 1998).

In such cases, they return to the place of release or stay around the shore. They often follow ships in the hope that someone will feed them and are then catch by fishermen. These turtles are losing their role in the marine ecosystem. All hatchlings are carnivorous during their first days, so they may attack each other. Others may suffer from eye infections. Adult turtles face the same threats (Spotila, 2004). If species with different feeding habits are kept in the same pool, the carnivores often attack herbivores. Unfortunately, this happens among turtles of the same species, because they are naturally solitary creatures and are stressed in pools.

### **MATERIALS AND METHODS**

Data was collected in 2019 in conservation centers in Sri Lanka with the cooperation of the Department of Wildlife Conservation, Sri Lanka. The centers were visited without prior notification; the evaluation was completed based on specific criteria. To make the evaluation understandable the below mentioned scoring system was selected: protection of nests; process of incubation and quality of care for hatchlings (Table 1).

**TABLE 01 :** Scoring system of protection of nests, process of incubation and quality of care for hatchlings.

	<b>Monitored parameters</b>	<b>Points</b>
Criterion 1 - Egg		
	The center protects all clutches on the beach.	100
	The center only protects some clutches on the beach – unprotected clutches are accessible to humans and predators.	80
	The center purchases eggs from people and thus supports the theft of eggs from clutches on the beaches.	60
	The center does not protect any clutches – eggs can be stolen from clutches and eggs consumed by predators.	40

Criterion 2 - Incubation		
	All clutches are relocated to the safe area.	0
	Only some clutches are relocated to the safe area.	- 6
	None of the clutches are relocated to the safe area.	- 10
Criterion 3 – Incubation		
	The eggs are relocated to a fenced area on the beaches; the area is protected from humans, predators, birds, and monkeys (the top is closed by a protective net).	+ 0
	The eggs are relocated to a fenced area on the beaches; the area is protected from humans, but not from predators.	- 6
	The eggs are not relocated to a fenced area on the beaches; eggs are accessible to humans and predators.	- 10
Criterion 4 – Incubation		
	The top of the fenced area is covered with a net to protect from birds and monkeys.	+ 0
	The top of the fenced area is not covered with a net to protect from birds and monkeys.	- 6
Criterion 5 – Incubation		
	Part of the fenced area is shaded.	+ 0
	There is no shaded area in the fenced area.	- 6
Criterion 6 – Incubation		
	Clutches are marked with date of installation.	+ 0
	Clutches are not marked with the date of installation.	- 4
Criterion 7 – Hatchlings		
	All hatchlings are released into the sea as soon as they hatch.	+ 0
	Only some hatchlings are released into the sea; some hatchlings remain in the pools in the centers.	- 6
	None hatchling are released to the sea; all hatchlings remain in pools in the centers.	- 10
Criterion 8 – Hatchlings		
	Hatchlings are released into the sea either in the morning or in the evening when sand is cool.	+ 0
	Hatchlings are not released into the sea either in the morning or in the evening when sand is cool.	- 8

Criterion 9 – Hatchlings		
	Hatchlings are released into the sea on the beaches without artificial lighting (without flashlights).	+ 0
	Hatchlings are released into the sea on the beaches with artificial lighting (with flashlights).	- 6
Criterion 10 – Hatchlings		
	Conservationists guard the hatchlings on the way to the sea and protect them from predators (birds, crabs).	+ 0
	Conservationists do not guard the hatchlings on the way to the sea; the hatchlings are not protected from predators (birds, crabs).	- 8
	The beach is not protected by the conservationists; clutches are robbed, eggs and hatchlings are consumed by predators.	- 10
Criterion 11 – Hatchlings		
	Conservationists regularly change the release points of hatchlings to prevent the creation of feeding stations for fish.	+ 0
	The conservationists do not regularly change the points where hatchlings are released; these points become feeding stations for fish.	- 8
Criterion 12 – Pools		
	There are no pools for healthy turtles in the centers.	+ 0
	There are pools in the centers. Some hatchlings are relocated but remain for a maximum of 24 hours after hatching. Pools are only for sick or injured turtles that would not survive in nature.	+ 0
	There are pools in the centers. Some hatchlings remain there for more than 24 hours after hatching.	- 8
	There are pools in the centers. All hatchlings remain there for more than 24 hours after hatching.	- 10
Criterion 13 – Pools		
	The pools are saltwater.	+ 0
	The pools are fresh water.	- 10
Criterion 14 – Pools		
	The turtles are fed regularly.	+ 0
	The turtles do not receive any natural feeding.	- 10

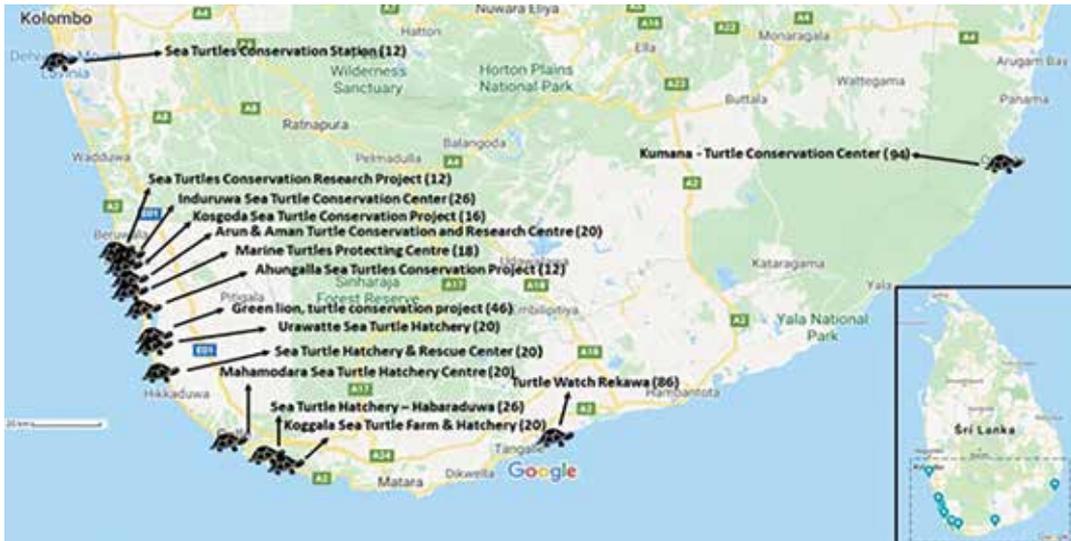


FIGURE 03 : Map of visited centers. A score for each center is presented in bracket.

TABLE 02 : Evaluation results for each center based on given criteria.

Name	Score
Kumana – Turtle Conservation Center	94
Turtle Watch Rekawa	86
Green lion turtle conservation project	46
Induruwa Sea Turtle Conservation Center	26
Sea Turtle Hatchery – Habaraduwa	26
Arun and Aman Turtle Conservation and Research Center	20
Mahamodara Sea Turtle Hatchery Centre	20
Koggala Sea Turtle Farm and Hatchery	20
Urawatte Sea Turtle Hatchery	20
Sea Turtle hatchery and Rescue center Hikkaduwa	20
Kosgoda Marine Turtles Protecting Center	18
Kosgoda Sea Turtle Conservation Project	16
Ahungalla Sea Turtles Conservation and Research Project	12
Sea Turtle Conservation Research Project Bentota	12
Sea Turtle Conservation Station Mount Lavinia	12

Centers that protected eggs on the beaches started with 100 points. This activity was identified in only 2 centers (Turtle Watch Rekawa and Kumana – Turtle Conservation Center). The remaining centers purchased eggs from fishermen. And this is what has the effect of encouraging nest theft. Other often problems were: hatchery was not partially shaded and there was no predator protection network. The clutches were less than 0.5 m apart. The conservationists did not change the releasing points. They released the hatchlings during the day when the sand was hot or on the beaches with lighting. The hatchlings were kept in the pools for more than 24 hours, somewhere hatchlings were kept in pools until tourists paid for their release. Turtles of the different ages and species were mixed in the pools. Some hatchlings had injuries caused by turtle cannibalism (Figure 4). The turtle diet was based mostly on fish and example, this type of diet is not suitable for the green turtle. The fence on the beach was wooden with large gaps that allowed predators to enter.



**FIGURE 04:** Turtles of different ages together, which could cause cannibalism. Hatchlings keep energy lost in the pools. The shallow water does not allow the turtles to dive and no waves cause problems with the muscles and lungs.

None of the centers reached the maximum points for the above reasons. A main reason was the purchase of eggs from thieves, with were attended by a total of 13 centers. Another factor was the method of incubation. Most centers had

their hatcheries covered with a net to protect them from predators, but only 6 centers had hatcheries partially shaded. Fifteen centers had clutches properly marked. Twelve centers did not release their hatchlings immediately, keeping at least 10% of the hatchlings in their pools. We observed 5 centers that released their hatchlings during the day; other centers planned the release in the morning or evening. Only 1 center used different points to release; in 2 centers hatchlings are released on beaches without artificial light. The only center without pools is Kumana - Turtle Conservation Center; all other centers have saltwater pools. In 12 centers they were found to be provided with the same fish based diet, regardless of the type of a ban. In the most centers it was observed that the guide encouraged in raising, touching or photographing with hatchlings or adults. Sometimes they release turtles directly into the sea, preventing them from coming into contact with the sand and pushing their home beach.

The centers have been established for protection of endangered species and their natural habitats (Ullmann and Stachowitsch, 2015). Many centers in Sri Lanka face a problem with predators they use wooden fences instead of wire mesh (or other similar material). Wooden fences are often demolished and allow predators to enter. Another problem is that clutches are concentrated in one place and therefore flooding or erosion can destroy all the clutches (Hewavisenthi, 2001). In most centers, disabled turtles were observed, injured during collisions with boats or after encountering fishermen and sidings with leucism (presented to visitors as albinism turtles) (Figure 5). The use of turtles, which are unable to survive at sea, to educate visitors, can be considered an effective method of protection (Arena *et al.*, 2013). Examples of these turtles are turtles that have swallowed plastic and are unable to dive. They must be kept in pools under certain conditions (not mixed with other species and with suitable feeding). Visitors then can see the turtles at any time of the day. Maintaining healthy turtles in pools is not an efficient method and is harmful.



**FIGURE 05 :** A turtle with leucism, considered by guides as a turtle with albinism.

## DISCUSSION

### *Centers and protection*

Admission to the centers for foreign tourists ranged from 1000-2000 LKR. There are boxes for additional financial contribution. An additional financial contribution will allow visitors to release the hatchlings. Some centers organize this activity during the day (however, the release should only take place in the morning or evening). Some centers offered souvenirs, such as clothes. This can help the locals financially, as it allows them to produce local souvenirs instead of poaching. In this way, awareness of the protection of the turtles will be raised.

The IUCN (2005) recommendation to keep only one turtle per pool was not followed in any center. If feeding hatchlings becomes expensive, it will be released. Such turtles have a minimal chance to survive. They are unable to identify predators and are unable to hunt. The same depth of nest and shading must be taken into

account when relocate clutches. Unfortunately, this rule is not always followed in Sri Lanka. That is why the olive ridley turtle has such a high mortality rate. This species has a very shallow nest and if the eggs are laid down deep enough, the hatching success decreases (Rajakaruna *et al.*, 2013). The ideal place for the protection of turtles is a guarded beach with a hatchery covered by a net against predators and partially shaded. Hatcheries are frequently moved to different places due to bacteria and are only used on for improperly placed clutches - those that are threatened by floods, erosion, human or wild predators (Wyneken *et al.*, 1988). Clutches that are not endangered by these factors are left in place and protected from predators. The same nest depth and temperature must be taken into account when relocate (Lutz *et al.*, 2002). All relocated clutches are marked and registered. Hatchlings are released immediately after hatching on the beach, without any lights and under the supervision of conservationists. Discharge points are frequently changed to avoid the creation of feeding stations for fish.

Conservation centers have existed in Sri Lanka since 1956. The first center was established by a non-governmental conservation organization in Yala National Park. This center was primarily established for the protection of sea turtles and quickly gained the attention of local and foreign tourists. The money collected from tourists was used primarily to run the center (Wilson and Tisdell, 2003). With increasing attention of tourists, the number of centers began to increase (Rajakaruna *et al.*, 2013). At present, these centers are renamed from "Turtle hatchery" to "Turtle conservation and research center" and are open all year round. We appreciate that the centers are trying to educate tourists and make educational materials available to them. In fact, the centers in Sri Lanka practice illegal turtle farming. The public is convinced that what the centers are doing right thing and thus contributing to protection. For this purpose, centers purchase eggs collected on beaches, regardless the way the legality of their acquisition. This position needs to be changed in the near future.

Tourists want to visit places that effectively contribute to nature conservation due to increased awareness. This positive impact is observable in Sri Lanka. An example is elephants riding, which was a common activity in the past and has become taboo today. We believe that keeping healthy turtles in pools will be taboo in the near future. Tourists will be able to see wildlife animals in small quiet groups and will require hatchlings to be released into the sea immediately after hatching, using headlamps with red lights, safe to observe turtles laying eggs.

### ***Impact of tourism***

Tourism generally has a negative impact on sea turtles. Hotels are built on nesting beaches. Beach lighting, noise, waste, and any changes in the natural environment of the beach negatively affect the life of nesting turtles. Vehicles driving along the beach become obstacles for hatchlings trying to get into the sea. The destroy clutches and beat the sand (Salmon and Witherington, 2005). Sticks from parasols can also destroy clutches. Motor boats are cause injuries to adult turtles.

In addition to the problems caused by tourism, it is necessary to focus on the education and development of locals as well. Wilson and Tisdell, (2003) argues that with increasing tourism, the demand for turtle products such as turtle meat or turtle eggs, which are thought to act as an aphrodisiac, is increasing. Although this consumption of turtles is illegal, this prohibited activity continues to be practiced. Only 33% of the eggs collected are used in hatcheries. According to a 2002 survey, 1% of foreign tourists and 5% of local tourists received offers of turtle meat or eggs on the southwest coast of the island. In Sri Lanka, turtle eggs are often offered in local businesses (Hewavisenthi, 1990). Thus, it is not just a problem of tourism. During our research, we were offered turtle meat on the northeast coast of Sri Lanka.

We are convinced that if local people understand the importance of sea turtles for the ecosystem, the importance of sustainable tourism and the potential to secure their income (for example from souvenir production), they

will stop selling eggs. The same trend can be observed in other countries, where thieves have become conservationists. Such a coup has succeeded in our ongoing project “Saveturtle.net” in Indonesia. Due to the understanding of the local people, the population of endangered species is growing.

## CONCLUSIONS

### ***Alternative methods of conservation***

Our aim is to help nature conservation centers develop effective conservation methods. We recommend starting with the implementation of small changes and gradual steps to effectively protect sea turtles. During the monitoring and evaluation of sea turtle conservation centers in Sri Lanka, we found that 12 of the 15 centers kept healthy hatchlings for more than 24 hours in the pools. The results should be release of hatchlings into the sea under the right conditions, i.e. 24 hours after emerging and at the right time of day – early morning or in the evening when the sand is cool. The change can be slow and gradual. We can start by keeping 10 % of hatchlings in the pools and releasing the rest. However, only the disabled turtles can be kept in the pools for more than 24 hours. Healthy living conditions must be ensured.

Other steps include partially shading the hatcheries (unshielded hatcheries have a birthrate of 100 % of the females), maintaining the original nest when moving eggs and maintaining safe distance between the nests. When releasing hatchlings, many different release points to be rotated to prevent predation. Do not leave different species of turtles in one pool – they are at risk of attack, cannibalism and thus increase the stress of animals. Each species has different feeding habits – paying attention to the diversity of feeds. Conservation centers should protect the welfare of sea turtles; reduce direct contact between tourists to photograph the hatchlings (Tissdell and Wilson, 2005; Ullmann and Stachowitsch, 2015). Such practices cause them stress. Ensuring sufficient space for turtles and ensuring optimal living conditions, as well as the treatment of sick turtles, is crucial for their well-being. Conservation centers must

be in good condition, fenced to keep out of predators and sufficiently large pools in good condition exclusively for handicapped turtles.

It is important that the centers stop purchasing eggs from local people. We are aware of the local's difficult living conditions for which they steal eggs. It is believed that buying eggs is better than their subsequent sale and consumption. Unfortunately, many of the embryos are already irreversibly damaged due to dangerous relocation and rotation, and only a small number of them will hatch. Poachers can become rangers and can be offered training in moving of eggs. Collaborating poachers/new rangers will not be rewarded with the number of eggs they bring, but by the number of hatchlings coming out of "their" nests.

Conservation centers can be a sustainable place of conservation and education. Visitors can learn about problems associated with the protection of sea turtle, learn about the causes of depletion of the population and be inspired to help themselves, i.e. by recycling or reducing their plastic consumption and not supporting businesses associated with unfair practices – purchasing souvenirs made from turtle shells, consuming turtle eggs. Schools or volunteers can help by creating informational panels or cleaning beaches.

Visitors can watch release of the hatchling, but only under certain conditions:

- Do not touch the turtles.
- Watch from a safe distance behind the fence or from the side so that it does not obstruct the path of the young.
- Do not use flash photography to avoid disorienting the hatchlings.
- Hatchlings must never be released directly into the sea (they must be allowed contact with sand surface for at least four meters).

If these conditions can not be met, visitors may be offered an alternative method of viewing turtles in the form of guided diving. However, diving should not threaten or in otherwise cause stress. Turtles should not touch in the water. Another option is to watch female turtles lay their eggs at night – but only with a red flashlight and in complete silence.

Our aim is to help local people and tourists to build a positive relationship with nature and take an interest in sea turtles. We hope to provide information on these critically endangered reptiles and the causes of depletion of their populations and teach them the principles of effective protection. Last but not least, we would like to inspire locals to start helping, as well, and help them find changes in their daily activities that benefit not only sea turtles but also the planet as a whole.

### *What can you do?*

We understand the complexity and difficulty of the situation. Local people have to take care of themselves. Tourists would like see sea turtles. Working with volunteers or non-profit organizations, motivating nature conservation centers and helping to get their activities in the right direction can be very useful and beneficial. Connecting with the local community, helping them find alternative ways of life and thus supporting their development helps not only sea turtles, but the whole community. The government can support staff in nature conservation centers by providing information and training and by motivating the centers to cooperate, exchange experiences and inform each other. We believe this would be a great source of motivational support.

WE BELIEVE BIG CHANGES IN EFFECTIVE CONSERVATION AND WE START FROM THE LITTLE STEPS. ALL CENTERS CAN ENSURE THAT:

- Nesting beaches are regularly monitored and protected.
- Nests on unsuitable parts of the beach (endangered by predators, poachers or high water levels) are relocated to the hatchery.
- The nest is relocated up to 8 hours after female has laid eggs.
- Eggs are never bought from people. (Buying eggs supports poaching.)
- Relocated nests in hatchery are located at least 50 cm apart.
- The depth of relocated nest is the same as in the original.

- Hatcheries completely protect nests from predators and poachers – nest enclosure on top, locked door, ...
- Hatcheries are partially shaded.
- Hatchlings are released into the sea within 24 hours of hatching.
- The hatchlings are released early in the morning or evening when the sand is cold.
- Hatchlings are released to the beach at least 4 m from the sea. (They need contact with the sand to remember the place for their future eggs lying).
- Each release hatchling takes place at different location the beach (so as not attract predators).
- There are not any healthy turtles in the pools.
- Pools are used only for injured or disabled turtles.
- There is only one species of turtle in each pool. (1 turtle per 1 pool is the best solution).

If you or your center would like to cooperate, please do not hesitate to contact the author of the article.

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