



unesco

BIOSPHERE RESERVES IN  
INDIA, SRI LANKA AND THE MALDIVES



POCKETS OF  
**H****PE**



UNESCO established the Man and the Biosphere (MaB) programme in 1971. It is an intergovernmental programme that aims to establish a scientific basis for enhancing the relationship between people and their environments. It combines the natural and social sciences with a view to improving human livelihoods and safeguarding natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable.

The long-term exploitation of nature has caused so much damage that some systems can no longer provide enough clean air or clean water, nor enough food where it is needed. We need concerted action to repair and conserve the natural habitats on which human life depends.

Biosphere Reserves contribute to the United Nations Decade on Ecosystem Restoration by enlarging the total area for nature conservation via restoration projects, scientific research, monitoring and education, and by raising the awareness of the general public.

Biosphere Reserves are places to apply, test and demonstrate best practices for human living in harmony with nature. They aim to enhance nature conservation, reduce the environmental footprint and keep the ecological carrying capacity of our natural ecosystems intact.

It is not easy to have a site listed as a Biosphere Reserve. All sites are externally examined and checked before they are approved. Globally, there are 727 properties, 168 in Asia and the Pacific, 12 in India, 4 in Sri Lanka and 3 in the Maldives. The success with which India, Sri Lanka and the Maldives are actively participating in the World Network is based on the countries' dedication and hard work.





UNESCO invites scientists, biologists, botanists, zoologists, climatologists, environmental engineers and science-technology specialists to support Biosphere Reserves. Universities should use them as outdoor laboratories to improve air quality, apply clean energies, reduce pollution, enhance water availability, redress biodiversity loss and test methods for climate resilience.

UNESCO encourages governments, foundations, the private sector and philanthropists to support the establishment of new additions to the World Network of Biosphere Reserves.

# What are Biosphere Reserves?



The World Network of Biosphere Reserves includes all major natural ecosystems, covering **> 7 million km<sup>2</sup>** (almost the size of Australia). **129 countries** have Biosphere Reserves and **260 million** people inhabit these worldwide

-  Human settlement
-  Research
-  Education & training
-  Tourism

**B**iosphere Reserves (BRs) are places where local solutions for sustainable human living and nature conservation are being tested and applied. Issues of concern include biodiversity, clean energy, climate, ecology, environmental education, green economy, and water- and waste-management. BRs are internationally recognized sites on land, at the coast or in the ocean. Governments decide which areas to nominate. Before approval by UNESCO, the sites are externally examined. If approved, they will be managed based on a plan that is reinforced by

routine checks to ensure credibility. BRs always remain under the sovereign jurisdiction of the national government. Local communities, universities, NGOs, UN agencies, the private sector and others can contribute to the management of these sites. BRs integrate three main functions:

- Conservation of biological and cultural diversity
- Economic development that is culturally and environmentally viable
- Scientific research, monitoring, education and training



## CORE AREAS

Core Areas comprise a strictly protected zone for nature conservation



## BUFFER ZONES

Buffer Zones are used to test and apply sound ecological practices supported by scientific research, monitoring, training and education



## TRANSITION AREAS

Transition Areas are areas where communities foster socio-culturally and ecologically sustainable human activities, including economic occupations

## Biosphere Reserves in India, Sri Lanka and the Maldives

<b>INDIA</b>	Established <b>12</b> Biosphere Reserves in 20 years
<b>SRI LANKA</b>	Established <b>4</b> Biosphere Reserves since 1977
<b>THE MALDIVES</b>	Established <b>3</b> Biosphere Reserves between 2011 and 2020



# India

Over 2,500 Bengal tigers (*Panthera tigris tigris*) are living in the wild in India

No.	Biosphere Reserve	Year of designation
1	Nilgiri	2000
2	Gulf of Mannar	2001
3	Sundarbans	2001
4	Nanda Devi	2004
5	Nokrek	2009
6	Pachmarhi	2009
7	Similipal	2009
8	Achanakmar–Amarkantak	2012
9	Great Nicobar	2013
10	Agasthyamala	2016
11	Khangchendzonga	2018
12	Panna	2020



In India, Biosphere Reserves are being coordinated by the Ministry of Environment, Forest & Climate Change  
 Website: <https://moef.gov.in/en>

# Nilgiri

STATES OF TAMIL NADU, KARNATAKA AND KERALA

▲ One of the largest Protected Area networks in India

🌿 Harbours the largest global populations of the Asian elephant, tiger, dhole and gaur

🌿 *Rhododendron arboreum nilagiricum*

👣 Indigenous groups: Todas, Kotas, Irullas, Kurumbas, Paniyas, Adiyans, Edanadan Chettis, Cholanaickens, Allar, Malayan

Nilgiris means 'blue mountains'. It exemplifies the tropical forest biome. Geographically, the Western

Chats are an important biodiversity hotspot for different types of tropical forests: 5,800 species of flowering plants, 120 species of mammals, 550 species of birds, 30 species of reptiles and amphibians, and 330 species of butterflies have been recorded here. Endemic plants include *Rhododendron arboreum*, *Garcinia morella*, *Glochidion neilgherrensis*, *Garcinia gummigutta*, *Michelia nilgirica*, *Mahonia leschenaultiana* and *Cinnamomum sulphuratum*. The fauna includes the tiger, elephant, gaur, lion-tailed macaque, sambar, wild boar, barking deer and Nilgiri tahr. Nilgiri is home for a number of tribes, mostly forest dwelling people with unique rituals and traditions, particularly relating to health care and respecting nature. While limited




Woman tea picker works at a tea plantation in the Nilgiri hills


economic activities are permitted in the buffer zone, the transition area is occupied mostly by private agriculture enterprises and forests, while tourism is coming up as an extra source of income for locals.




# Gulf of Mannar

STATE OF TAMIL NADU

 Seagrass beds  
(*Thalassia*)

 Dugong  
(*Dugong dugon*)

 *Bruguiera gymnorhiza*  
mangrove

 Marakeyars,  
local people mostly  
engaged in fisheries

*Seagrass beds are important blue carbon ecosystems. They are salt-tolerant and spend their entire life cycle fully submerged*

The Gulf of Mannar, with its coral reefs, seagrass beds and mangroves, is considered one of the world's richest marine ecosystems, in which 4,223 species of plants and animals are known to live. These include the sea cow (*Dugong dugon*), a species that the International Union for Conservation of Nature (IUCN) Red List classifies as 'vulnerable'. Seagrass beds serve as nursery and spawning grounds for diverse biota and habitat for algae, crustaceans, molluscs, echinoderms, fish, marine turtles, dugongs and many other mammals. People living in the Gulf of Mannar are mainly Marakeyars, who are economically engaged in fisheries. The Global Environmental Facility (GEF) has supported the establishment of this BR, including the setting up and functioning of the Gulf of Mannar Biosphere Reserve Trust, which is responsible for coordinating




*Sea cows (*Dugong dugon*) depend on seagrass beds for forage*


the management plan for the reserve in concert with government agencies, private entrepreneurs and local community representatives. This area is also the last refuge of an invertebrate, the unique 'living fossil' *Balanoglossus*, that links vertebrates and invertebrates.




# Sundarbans

STATE OF WEST BENGAL

 The largest delta and mangrove forest in the world

 Only mangrove forest in the world inhabited by tigers

 *Heritiera* and many other mangrove species

 Some three million people live in this biosphere reserve, mostly engaged in fisheries



*Above: Aerial view of mangroves and tidal creeks*


*Below: Commercial fisheries provide the main source of income and food for the local people*


The Sundarbans Biosphere Reserve is the largest delta in the world. It includes one of the most productive ecosystems; however, most of the productivity is confined to aquatic systems. It supports about 300 species of birds, 7 species of amphibians, 59 species


of reptiles, 165 species of fishes, 110 species of molluscs and 64 species of crabs. This deltaic ecosystem contains the largest contiguous mangrove forest in the world, due to favourable climatic conditions for mangrove growth. Three million people live in the reserve. They depend on forest-sea resources for fuel wood, honey, fish, and shrimp as their main sources of income. The Sundarbans serve as a natural buffer against storms and cyclones in the Bay of Bengal. The BR plays a critical role in coastal ecology by buffering inlands from cyclones, stabilizing sediments and aiding land maturation. The Sundarbans are facing challenges due to climate change. Rising sea levels, flooding of low-lying deltas and salinization of soils has threatened the well-being of local human populations and of the diverse mangrove ecosystems.






 Outstanding natural beauty. Glaciers provide a perennial source of water to tributary streams of the Ganges

 Snow leopard, Himalayan black bear, musk deer, bharal sheep

 Dominant plant family: *Asteraceae*. High altitude forests with Himalayan maple (*Acer caesium*), fir (*Abies pindrow*) and white birch (*Betula utilis*)

 Communities living here practise marginal subsistence agriculture, rear cattle for milk and sheep for wool

## Nanda Devi

STATE OF UTTARAKHAND

**N**anda Devi Biosphere Reserve, with its highest peak at 7,817 m, is located in the Himalayan mountains. The property includes a World Heritage Site, forests, agricultural land, grassy slopes, alpine meadows and snow-covered areas. Most of the more than 1,000 plant species are native to the Himalayas. Many of the plants are endemics, near endemics, and species that are used by humans as food, fodder and medicine.

Mammals include the snow leopard, Himalayan black bear, brown bear, musk deer and blue sheep. Over 15,000 people live in the Biosphere Reserve. Local communities practise marginal subsistence agriculture, rear cattle for milk and sheep for wool. They also cultivate medicinal plants and practise apiculture and horticulture. The snow-clad peaks, 30 glaciers, rich

*The Valley of Flowers National Park inside the Nanda Devi Biosphere Reserve is known for its endemic alpine flowers*

biodiversity, valleys, meadows and rivers, combined with the unique culture of local communities, make the place a valuable area for ecotourism development.



*The elusive snow leopard (*Panthera uncia*)*



# Nokrek

STATE OF MEGHALAYA

▲ The entire area is mountainous. Nokrek is the highest peak of the Garo hills. Major rivers: Ganol, Dareng and Simsang

🐾 Slow loris

🌿 *Bombax ceiba*,  
*Cassia fistula*

👣 More than 22,000 Garo people live here

*Indian Laburnum*  
(*Cassia fistula*),  
a member of the  
legume family  
(Leguminosae)

Nokrek is located in the Tura range of the Garo hills. The entire area is mountainous, with its highest peak at 1,412 m. The Biosphere Reserve embraces undulating hills, steep slopes, and a river catchment system that provides water to several towns. Tropical climate with monsoon rains offer ideal conditions for evergreen forests, including bamboo forests, and a variety of endemic *Citrus* species, including the Indian wild orange (*Citrus indica*). The true origins of citrus fruits are not exactly known. It is believed that they originated in north-eastern India, China and Myanmar. Until confirmed as a hybrid, *Citrus indica* was long thought to be the most likely ancestor of cultivated citrus fruits. Other characteristic species of the reserve include *Bombax ceiba* (cotton tree), *Sterculia villosa* (hairy sterculia) and *Cassia fistula* (Indian laburnum). Vulnerable fauna species include the slow loris, giant flying squirrel and pig-tailed macaque.



*Slow loris* (nocturnal primates of the genus *Nycticebus*)

The entire reserve is blessed with a rich floral diversity including 804 species of angiosperms. *Ficus*, with 15 species, is the most diverse species in the reserve. In addition, the reserve is home to the tiger, leopard, elephant, red panda and hoolock gibbon. Shifting agriculture is the most important economic activity. Local people rely on natural forest produce such as timber, honey and wax, while bananas, rice, cashew nuts and tea are the reserve's main commercial exports.



# Pachmarhi

STATE OF MADHYA PRADESH

High floristic diversity and unique plant life forms

Genetic large mammals include gaur (*Bos gaurus*), chital deer (*Axis axis*) and sambar deer (*Cervus multicolour*). Endemic fauna includes the Indian wolf

Teak (*Tectona grandis*) and sal (*Shorea robusta*)

Gond tribes live in the forests. Rock paintings up to 2,500 years old have been discovered in this reserve

Pachmarhi, located in central India, with Dhoopgarh at 1,352 m being its highest peak, contains valleys, marshes,

streams and waterfalls. The region is recognized as a 'Genetic Express Highway' linking two biodiversity hotspots: the Eastern Himalayas and the Western Ghats. It consists of forests, agricultural lands and water bodies. *Tectona grandis* (teak) and *Shorea robusta* (sal) are the most common trees. Species inventories include 60 species of ferns, over 50 species of mammals, 254 bird species, 30 reptile species and 50 butterfly species. The largest wildlife include bears, tigers and leopards. The Gond people, accounting for most of the BR's indigenous population, live in the forests and have a special connection to the reserve.

*Pachmarhi holds one of the richest concentrations of rock art.*




Flowers of the sal tree (*Shorea robusta*)

Korku people introduced the cultivation of potatoes and produce honey in significant quantities for commercial use. The area contains an extensive cave network of great archaeological interest, containing rock paintings up to 2,500 years old.




# Similipal

STATE OF ODISHA

 Forested area with many waterfalls

 Indian great hornbill (*Buceros bicornis*)

 *Bombax ceiba*, *Callicarpa arborea*

 1,265 villages are located within the BR. Dominant indigenous groups include Erenga Kharias and Mankirdias



Similipal is located in east India. Khairiburu, at 1,168 m above sea-level, is the reserve's highest peak. Numerous waterfalls and perennial streams flow into large rivers. The tropical monsoon climate allows for 1,076 species of vascular plants. Among them are 93 species of orchids,

*The Indian great hornbill is native to the forests of Similipal*

300 species of medicinal plants and 52 species of endangered flora. Two endemic orchid species are *Eria meghasaniensis* and *Tainia hookeriana*.

The site is home to 42 mammal species, 264 bird species, 39 reptile species and 12 amphibian species. The royal Bengal tiger and Asiatic elephant have both been observed. There are 1,265 villages in the reserve. Two tribes, the Erenga Kharias and the Mankirdias, inhabit the forests and practise traditional agricultural activities (collecting seeds and timber). Other dominant indigenous groups include the Ho, Gond and Munda. Similipal's cultural significance is characterized by stories and paintings that date back to 700 BCE.

*Pinus roxburghii* is the only conifer that has been recorded in the reserve



# Achanakmar-Amarkantak

STATES OF MADHYA PRADESH AND CHHATTISGARH



Forested area (63%), high mountains, shallow valleys and plains



Asian whitebacked vulture (*Gyps bengalensis*)



*Curcuma aromatica*, *Cedrus deodara*



27 tribal and non-tribal communities inhabit 418 villages. Their main occupation is agriculture

The Achanakmar-Amarkantak Biosphere Reserve is the most dramatic landscape in the Indian states of

Chhattisgarh and Madhya Pradesh.

It has a topography ranging from high mountains to shallow valleys and plains. Forests constitute 63 per cent of the area. It has 1,498 plant species and 327 species of fauna, including the antelope, wild dog, crane, vulture and grove bush frog. The geology of the area includes sandstone, shale, limestone, basaltic lava and bauxite. Soil and moisture conservation are supported via the construction of check dams, restoration of bamboo forests and grass meadows, and landscape conservation. Twenty-seven tribal and non-tribal communities inhabit 418 villages. The total population of the area


Above: A beautiful landscape at Achanakmar-Amarkantak  
Below: Wild turmeric (*Curcuma aromatica*)




belonging to local communities as per the last census (2001) is 436,128 inhabitants. Their main occupation is agriculture (including the production of medicinal plants), bamboo handicraft and non-timber products produced in the buffer zone and transition areas.

# Great Nicobar

UNION TERRITORY OF ANDAMAN AND NICOBAR ISLANDS

 Tropical forest ecosystems

 Marine ecosystems, with giant leatherback turtle

 Tribal people live in the forests, particularly along the rivers and streams

Great Nicobar is the southernmost island of the Andaman and Nicobar archipelago, with 103,870 ha of tropical forest. The Biosphere Reserve harbours tropical wet evergreen forests and coastal plains, with a rich biodiversity, including 650 species of plants and 1,800 species of fauna. The crab-eating macaque, Nicobar tree shrew, dugong, Nicobar megapode, serpent eagle, saltwater crocodile, marine turtle and reticulated python are endemic and/or endangered. The Mongoloid Shompen tribe, with a total of 200 people, lives in the forests of the reserve, along its rivers and streams. They are hunters and food gatherers, dependent on forest and marine resources for sustenance. Another Mongoloid tribe, the Nicobarese, about 300 in number,



*The endangered leatherback turtle feeds on jellyfish (often confused with plastic bags)*

used to live in settlements along the west coast, catching fish from the sea. There are also settlers that live along the southeast coast of the island, practising agriculture, horticulture and fishing.

*A big wave at a beach of the Andaman and Nicobar Islands*



# Agasthyamala

STATE OF KERALA

Mountain landscapes

Cardamom plants, nutmeg plants, black pepper

Kani tribes (Kanikaran), one of the oldest tribes in India

Black pepper and cardamom forest in Agasthyamala

located in the Western Ghats, Agasthyamala has peaks reaching 1,868 m. Agasthyamala covers 3,500 km<sup>2</sup> and

encompasses tropical forest ecosystems that function as a genetic reservoir of cultivated plants, including cardamom, *jamun* (*Syzygium cumini*), nutmeg, pepper and plantain. The reserve is home to 2,254 species of plants, 79 species of mammals, 88 species of reptiles, 45 species of amphibians, 46 species of fishes and 337 species of birds.

About 30,000 people from the Kani tribes of Tamil Nadu and Kerala live in the reserve. The community uses a variety of biological resources for sustenance but is rarely involved in their commercialization. In addition, about 700 non-tribal inhabitants live on tea estates located in the core area.



The plum-headed parakeet (*Psittacula cyanocephala*) is one of many colourful bird species that can be spotted here


The reserve occupies a prominent place in the cultural heritage and history of India. In particular, its prominence in the epic Ramayana has made it a famous site for Hindu pilgrimages.







## Khangchendzonga

STATE OF SIKKIM

 High mountain landscapes rising over 8,500 m

 Himalayan tahr and over 40 mammal species

 30 species of *Rhododendron*

This Biosphere Reserve contains some of the highest ecosystems in the world, with elevations up to 8,586 m above sea-level. Situated over the Himalayan trans-axial belt, the site consists of deep gorges and gullies, river terraces and lakes, as well as rocky outcrops and glacial moraines. The core zone



*The Himalayan tahr (Hemitragus jemlahicus)*

*Mount Khangchendzonga is the third highest peak in the world*


has over 150 glaciers (including the 26 km long Zemu glacier) and 73 glacial lakes. The reserve includes vast natural forests with high species diversity and endemism. It is home to orchids and many other rare plant species. Epiphytes and lianas are abundant. There are about 30 species of *Rhododendrons* and 42 mammal species.


The Khangchendzonga National Park within the BR is an Important Bird Area (IBA). It supports 130 endemic species of the Eastern Himalayas and over 200 bird species of conservation concern, including 7 globally threatened species.


There are 8,353 families with a population of 35,757 people living in 44 villages. The main economic activities are agricultural and horticultural crop production, animal husbandry, fishing, dairy products and poultry farming. The reserve has religious and cultural significance, with mountains and peaks, lakes, caves, rocks and hot springs considered sacred pilgrimage sites.

# Panna

STATE OF MADHYA PRADESH

 Forests, Ken River, agricultural land

 Fauna includes the blossom-headed parakeet (*Psittacula roseata*)

 The major ethnic groups are Gond, Khairua and Yadava



Panna comprises effectively protected and minimally disturbed areas, with forests, agriculture, water bodies and

settlements. The area provides a habitat to a number of rare species, and it functions as a Critical Tiger Habitat. Over 280 species of birds have been recorded, including the Indian paradise flycatcher. The reserve is characterized by forests, as well as aquatic and marshy vegetation. It encompasses nearly 300 villages. The forest supports the livelihood of its inhabitants with medicinal plants and secondary products such as *kattha* (*Acacia catechu*) gum and resins that are collected from the forest. Sustainable agriculture, horticulture, forestry, and cultural and ecotourism provide income. The major ethnic groups are Gond, Khairua and Yadava. Within the peaceful environs of Panna Biosphere Reserve are nestled some magnificent mementoes of a glorious past and marvels of ancient and medieval architecture. Panna is the most sacrosanct pilgrimage for followers of the Pranami sect.

Above: The Pandav Falls in Panna

Below: Village people sing religious songs as an important part of the pilgrimage of the Pranami sect







The Asian elephant (*Elephas maximus maximus*) is one of the wildlife conservation flagship species in Sri Lanka, with 2,500–4,000 animals living in the wild

No.	Biosphere Reserve	Year of designation
1	Hurulu	1977
2	Sinharaja	1978
3	Kanneliya–Dediyagala–Nakiyadeniya (KDN)	2004
4	Bundala	2005

In Sri Lanka, Biosphere Reserves are being coordinated by:


The National Science Foundation,  
No. 47/5 Maitland Place, Colombo 7,  
Sri Lanka


Website: [www.nsf.gov.lk](http://www.nsf.gov.lk)




# Hurulu

NORTH CENTRAL PROVINCE

 Forests with elephants

 Leopard (*Panthera pardus*)

 Ebony tree (*Diospyros ebenum*)

 Villagers use the forest for shifting cultivation

*Sri Lankan leopards inhabit the jungle in Hurulu*

**H**urulu Biosphere Reserve comprises 25,500 ha within the tropical dry evergreen forest in Sri Lanka.

A dry monsoon type climate prevails, with mean annual precipitation of 1,600 mm/m<sup>2</sup>/year and a mean annual temperature of 27.3 °C. Dominant plant species are setinwood (*Chloroxylon swietenia*) and palu (*Manilkara hexandra*) together with the ebony tree (*Diospyros ebenum*). The reserve is an important habitat for the Asian elephant. Among the most endangered animal species here are the turtle (*Testudo elegans*), Ceylon junglefowl (*Gallus lafayettii*), the Asian elephant (*Elephas maximus*), the leopard



*A pair of young toque macaques (Macaca sinica)*


(*Panthera pardus*) and the rusty-spotted cat (*Felis rubiginosa*).


Villagers use the forest for shifting cultivation.




# Sinharaja

SABARAGAMUWA AND SOUTHERN PROVINCES

 The largest rain forest in Sri Lanka

 Sri Lankan elephant and leopard

 The local people collect herbal medicine, edible fruits, nuts, mushrooms, firewood, a sugary sap from native pal species, and they engage in honey production



**S**inharaja is the largest continuous evergreen rainforest remaining in Sri Lanka. Its importance for conservation is linked to the forest and its high endemism of flora and fauna. The reserve has many endemic species,




A girl carrying firewood on top of her head in the Sinharaja rainforest


*A green garden small-scaled lizard (Calotes calotes) in Sinharaja*

including trees, insects, amphibians, reptiles, birds and mammals. In 1977, all timber exploitation in the entire forest was banned and, in 1978, it was designated as a UNESCO Biosphere Reserve. Only 84 families were residing in the reserve. These families make their living from farming rubber, tea, cinnamon and seasonal crops such as paddy rice and vegetables. Approaches to improve rural development and local livelihoods include enrichment planting, using primary forest timber and non-timber species in *Pinus* stands, exploring the potential of locally esteemed non-timber species for domestication, and deploying young people from adjacent villages to guide visitors around Sinharaja. Some 20,000 visitors come to Sinharaja annually.

# Kanneliya–Dediyagala– Nakiyadeniya (KDN)

SOUTHERN PROVINCE

 The Gin Ganga and Nilwala Ganga rivers wind their way through the rainforest, next to some spectacular waterfalls

 Sri Lanka produces 80–90% of the world's supply of cinnamon

 The local population engages in a variety of economic activities, including paddy cultivation

*Right: Unidentified fungus species. These decomposers play highly important roles in forest ecosystems*  
*Bottom: Produce of the Ceylon cinnamon tree (Cinnamomum verum). Sri Lanka produces 80–90% of the world's supply of cinnamon*




This Biosphere Reserve is a complex of three adjoining forests located in the southern part of Sri Lanka. It is one of the world's tropical rainforest biodiversity hotspots due to the exceptional presence of species with incomparable


levels of endemics and rare species. Scientific research carried out in this forest complex confirmed that the site has the richest plant biodiversity in the island. The core zone of the reserve covers the whole of the forests of Kanneliya, while the entire forests of Nakiyadeniya and Dediyagala form its buffer zone. The cultural, historical and socio-economic value of the site is enormous. It includes many land use types with tea, rubber, cinnamon and paddy cultivations and homesteads, townships and roads. About 24,000 people reside in the reserve, depending on various occupations, including the utilization of non-timber products such as fruits, medicinal plants, resins, fiber, fuel wood and bush meat.




# Bundala

SOUTHERN PROVINCE

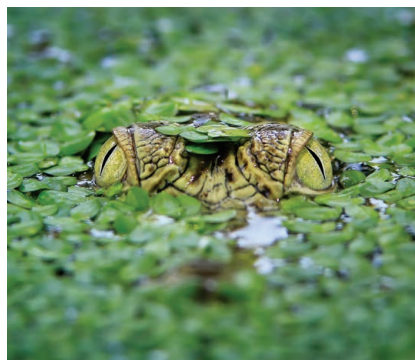
 Wetland ecosystems with internationally important wintering ground for migratory water birds

 Saltwater crocodile, the largest living reptile

 Reedbeds dominated by *Typha angustifolia*

**B**undala was designated a Biosphere Reserve by UNESCO in 2005. It is Sri Lanka's only coastal Biosphere Reserve, covering an area of 18,242 ha. The Bundala National Park forms the core zone. It has brackish water lagoons, rich in wetland species, including two species of crocodiles. Flagship conservation species include the greater flamingo, Asian elephant and leopard. The saltwater crocodile, the largest living reptile, known to be dangerous to humans, inhabits Bundala. It can exceed a length of 6.3 m and a weight of 1,300 kg. Habitat mapping revealed ten main habitat types, such as the sea shore with sand dune vegetation; scrubland; dry-mixed evergreen forest, with thorn forest and arid zone forest; lagoons with salt marshes; seasonal freshwater bodies; paddy; home gardens with aquatic

*Typha angustifolia*. Wetlands provide a habitat for many species of plants and animals



*The saltwater crocodile (Crocodylus porosus) is one of two crocodile species in Sri Lanka*

vegetation; and mangroves. Bundala has a mosaic of ecosystems including modified areas, where people live their daily lives while contributing to sustainable development, as well as areas of high biodiversity value, such as wetlands of global importance, including a Ramsar Site. The habitat diversity and rich bird life makes Bundala an ideal place for birdwatchers.





# The Maldives

*The Maldives-Chagos-Lakshadweep atolls are the largest atoll system in the world and the most extensive coral reef system in the Indian Ocean*



No.	Biosphere Reserve	Year of designation
1	Addu	2020
2	Fuvahmulah	2020
3	Baa	2011

In the Maldives, Biosphere Reserves are being coordinated by the focal point for biosphere reserves at the Ministry of Environment

Website: <http://www.environment.gov.mv/v2/en>



Baa Atoll





Fuvahmulah

Addu Atoll

## Addu

ATOLL OF ADDU

 The landscape is made up of ocean and 30 small islands, 17 uninhabited

 19,000 people inhabit the Addu Atoll. They make a living from fisheries and tourism related to underwater sports

**A**ddu Atoll is the southernmost atoll of the Maldives, formed by the peripheral reef, consisting of 30 small islands.

This site boasts an impressive reef ecosystem with outstanding biodiversity that includes over 1,000 fish species. Within the property, there are lagoons, reef passes, seagrass beds, sandbanks, coral islands, lush tropical vegetation, mangroves, wetlands and brackish lakes, with a large variety of endemic species including the Maldivian cardinalfish, Maldivian grubfish, Maldives triplefin and little combtooth blenny. Blue carbon ecosystems (seagrass and mangroves) function as carbon sinks and combat the effects of climate change.

The reserve boasts a population of 19,319 inhabitants, in residential and agricultural areas. Most people make a living from marine resources and



*Coconut palms (Cocos nucifera) have been sustaining communities for thousands of years with food, fuel, cosmetics, medicine, building materials and energy*


tourism. The beauty of this Biosphere Reserve attracts many visitors. The Maldivian atolls are at risk from rising sea levels due to climate change.


*Shark among a school of small fish*




# Fuvahmulah

ATOLL OF FUVAHMULAH

 Unique coral sand beach formations

 Whale sharks, mangroves, coral reefs

 The Biosphere Reserve has a population of 8,510 inhabitants

 Fuvahmulah is the third most populated island in the Maldives

Fuvahmulah is located in southern Maldives and is 1,300 ha in size. This atoll boasts incredibly diverse coral ecosystems, as well as mangroves and wetland systems. The reef systems are home to tiger sharks and whale sharks. However, it is its diversity of fish that is immensely significant, with over 1,200 species, as well as its important role for 167 species of migratory birds. The Fuvahmulah Biosphere Reserve is dependent largely on its tourism and fisheries. The human population numbers 8,510 inhabitants. The people of Fuvahmulah value their socio-cultural individuality and maintain a life in harmony with nature.

*The whale shark (*Rhincodon typus*) is filter-feeding and the largest known fish species, with a length that can exceed 18 m, and a lifespan of 80-130 years*



*The Maldives are located in a marine environment, with many islands and atolls*

The communities within this Biosphere Reserve are environmentally conscious and promote sustainable development. Many of the species found in the marshes are used by the Fuvahmulah community for traditional medicine.








## Baa

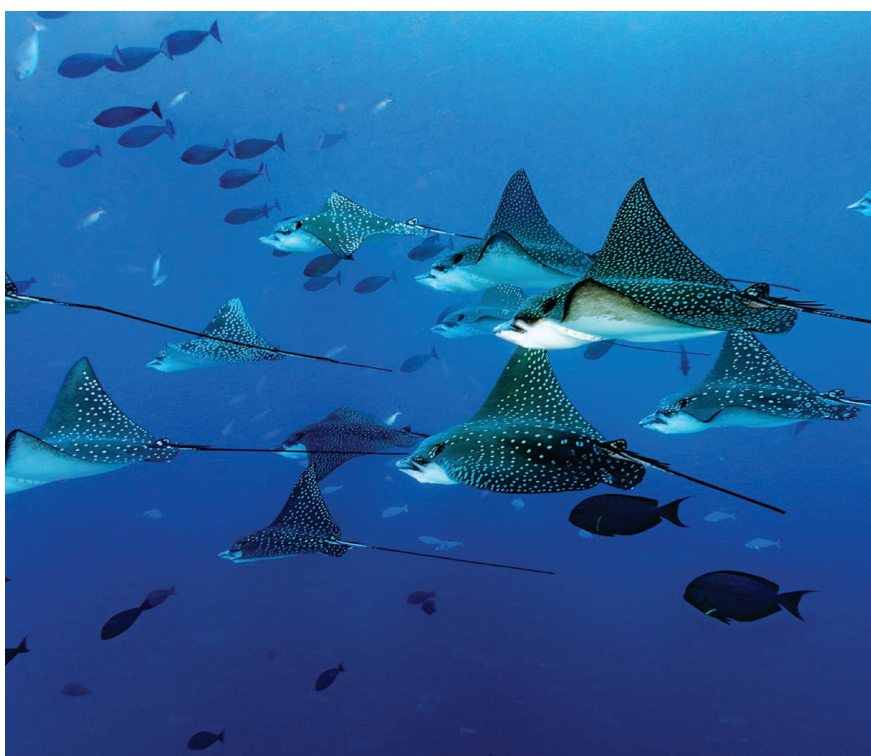
ATOLL OF BAA

 Coral reef formations

 The Maldives is home to the world's largest population of reef manta rays (*Mobula alfredi* and *M. birostris*)

 Coconut trees provide food, drink, fuel, cosmetics, medicine and building materials

 Underwater sports, such as snorkelling and scuba diving



*Cocos nucifera*,  
*Casuarina equisetifolia*,  
*Coccoloba uvifera*,  
*Ipomea pes-caprae*,  
*Thespesia populnea*,  
and *Terminalia catappa* are typical beach plants

Baa Atoll is located in the central western part of the Maldives. It acts as a stepping stone for the transport of planktonic larvae. It has a warm and humid tropical monsoon climate, with a rainy period (May to November), and a dry period (January to March).

Two varieties of manta rays, *Mobula birostris* and *M. alfredi*, can reach up to 7 m and 5.5 m in width, respectively. They have the largest brains of all fish

The main habitat types are coral reefs, islands, seagrass beds and mangroves. The reefs support 250 species of corals, 1,200 fish species, marine turtles, manta rays (*Manta birostris*), whale sharks (*Rhincodon typus*), numerous species of seabirds, as well as the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), Napoleon wrasse (*Cheilinus undulatus*) and tawny nurse shark (*Nebrius ferrugineus*). The reserve comprises 75 islands, with a population of 12,000 people. The most important human activities in the area are tourism and fisheries. Six islands have been developed as resorts for tourism, and receive more than 350,000 tourists each year.



# Living in Harmony with Nature



We are living in a world that is constantly changing. Many of these changes are massive, partially non-natural, including biodiversity loss, climate change, environmental degradation and water calamities.

According to Charles Darwin's theory of the origin of species, it is not the most intellectual of species that survives; it is not the strongest that survives; but the species that survives is the one that is best able to adapt and adjust to the changing environment in which it finds itself.

This means we must strengthen our capacity to adjust to changing environments, if we wish to survive.

Human survivability, however, absolutely depends on 'Living in Harmony with Nature'. Nature provides the air we breathe, the water we drink, the food we eat and so much more.

## How can we live in harmony with nature?

First we need recognition and awareness.

Communities recognize that human living depends on an intact nature

People appreciate that nature provides air, water, food and much more

Humanity sets aside enough places for strict nature conservation

Populations apply science education, scientific research and scientific monitoring to detect and be able to adapt to changes and utilize best practices

And then there is the application of best practices.

- Recognize and participate in the Sustainable Development Goals and international networks and mechanisms
- Apply biodiversity conservation *in situ* and *ex situ*
- Enhance climate change adaptation and mitigation
- Respect the ecological carrying capacity that is needed for human survival
- Manage water resources based on science
- Support the circular economy and practise good waste-management techniques
- Promote ethics-based environmental stewardship



— BIOSPHERE RESERVES —

*Living in Harmony  
with Nature*



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