



The Tonle Sap Biosphere Reserve

The Heart of Cambodia



Fast Facts

...about the Tonle Sap Biosphere Reserve

The largest freshwater lake in Southeast Asia

With a surface of 16,000 km² in the wet season the Tonle Sap Lake is the largest freshwater lake in Southeast Asia.



A unique hydrological system

Each year in June, monsoon waters from the Mekong reverse the Tonle Sap River flow and pour water into the Great Lake, expanding its surface sixfold.

The largest seasonally flooded forest habitat in Southeast Asia

During the rainy season the adjoining forests are flooded, providing an important breeding ground for fish. About 200 species of plants have been documented in the flooded forests.



The largest colonies of endangered water birds in Southeast Asia

The Tonle Sap Great Lake is habitat to an exceptional number of globally threatened animal species, such as the Siamese crocodile, freshwater turtles, otters, and the Mekong giant catfish - one of the largest and rarest fresh-water fish in the world.

One of the most productive inland waters in the world

The Tonle Sap Lake is not only rich in natural values, it directly supports more than a million people providing the single largest source of protein for Cambodia's young and growing population.



Over 200 picturesque floating villages

About 80,000 people inhabit the lake itself in over 200 floating villages, many of which have been established more than a hundred years .



A Unique Hydrological System

The Tonle Sap Lake is linked to the Mekong River, at Phnom Penh, by a 100km-long channel, also known as the Tonle Sap River. Each year with the onset of the annual rainy season, early in June, the Mekong River rises and the lower Mekong delta becomes flooded. Because it cannot absorb the mass of water, the flow is forced backwards up the Tonle Sap River and reverses its flow.

An immense waterscape

For the next four months the river flows back into the lake, increasing the depth of the lake from 1 meter to about 10 meters and expanding the surface from 2,500 km² to 16,000 km². An extensive forest area is flooded, providing habitat to over 200 aquatic plant species and important fish breeding grounds. In October with the beginning of the dry season the river reverses its flow again and the lake starts draining.



Fishing, not just fish

This extraordinary process makes the Tonle Sap Lake one of the world's richest sources of fresh-water fish. Millions of migrating fish arrive with the rising water and provide livelihoods to about one million people living in the

*A river that reverses
its flow twice a year*

The reversal of the current of the Tonle Sap River is celebrated during the Bon Om Tuk festival, where boat races are held on the Tonle Sap River.



Biodiversity Hotspot

The natural phenomenon of the hydrological flood cycle produces valuable nutrients that feed a rich biodiversity of species. About 200 species of plants have officially been recorded on the floodplain and much is still left to be discovered.

A refuge for animals

Over 200 species of fish occupy the Tonle Sap. Other animals living on the lake include turtles, macaques, otters and water snakes. The flooded forests provide an exceptional site for waterbirds. Almost 100 species of water birds, of which at least 16 belong to species of globally threatened birds, live on the lake. Between October and May thousands of pairs of pelicans, storks, ibis, darters and cormorants nest in the trees.



A forest that remains under water for six months

Flooded Forests



Flooded forests in the Tonle Sap cover about 300,000 hectares. Trees and shrubs are seasonally flooded from August to November, but remain dry during the rest of the year.

A rich natural asset

The flooded forests provide construction material for houses, fishing gear, fuel wood and traditional medicine. But most importantly they provide a rich breeding ground for fish.



Besides of construction material and fuel wood flooded trees provide a very important shelter from the strong monsoon winds.

People on the Lake

About 1,6 million people live in the TSBR and 80,000 people inhabit the lake itself living in over 200 floating and stilted villages. The ethnic composition of the population on the lake includes Khmer, Vietnamese, Chams and Chinese.



For Hundreds of years, communities living on the Tonle Sap Lake have adapted to the rise and fall of water levels. The finest example of this adaptation is the fully floating village. Families live on house-boats or in homes built on bamboo rafts. When the water level rises the homes are moved inland with the shoreline or moved up a river.

House movement on the Lake corresponds with the water level. Some people have to move their houses up to 10 km.



Floating groceries stores, floating gardens and a floating school.

Houses on stilts

Another common form of dwelling is homes built on stilts to correspond to the rising and falling water level. When the water level recedes, some houses are dismantled and moved closer to the lake. Houses are constructed of wooden planks or palm leaves and thatch.





Production of *prahok*, a fermented fish paste, embodies the culinary identity of the Khmers.

Activities

During the wet season...

The majority of the people living around the lake are family fishermen. However middle and large scale fishing activities are present in commercial fishing lot areas. In 2000, 56% of the former fishing lot areas were released to community management and are now organized as community fisheries.

...and in the dry season

When the flood water recedes, dry season rice agriculture is the most common crop on the lakeshore floodplain. Villagers retain water in reservoirs to irrigate their fields. Beans, watermelons and sesame are also grown.



Migrants on the lake

Agricultural activities are seldom practiced by the people living on the lake, but mainly undertaken by villagers migrating from the uplands.

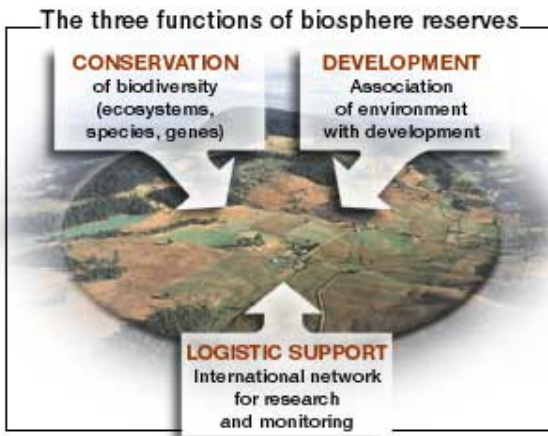
Over time ingenious land-use practices, which do not deplete the natural resources, have been developed. These farming methods can provide valuable knowledge for modern production systems.



Small and medium scale fisher are dominant on the lake.

Biosphere Reserves

In 1997 the United Nations Educational, Scientific and Cultural Organization (UNESCO) designated the Tonle Sap Lake and its flood plain as a Biosphere Reserve. Each biosphere reserve is intended to fulfill three basic functions.

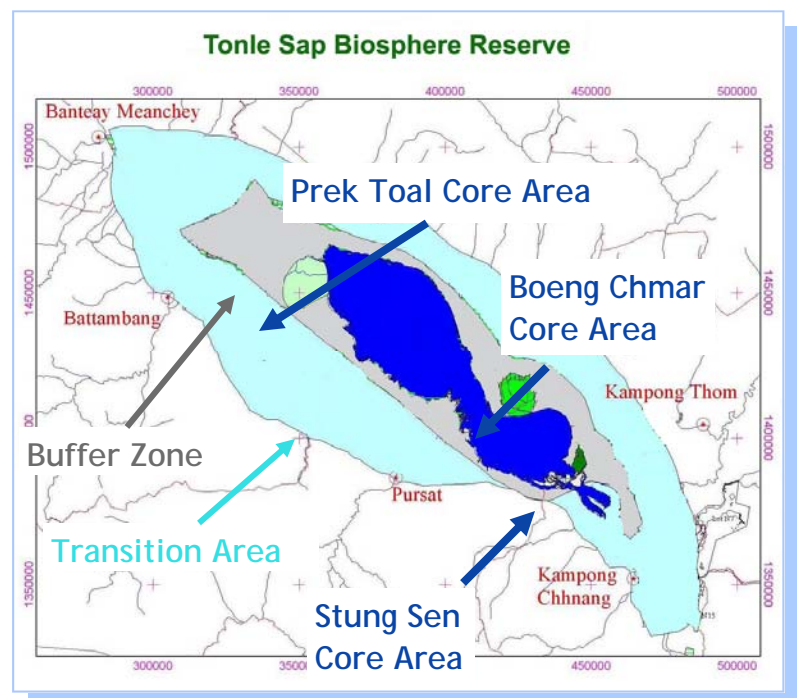


- **Conservation** - to contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- **Development** - to foster economic and human development which is socio-culturally and ecologically sustainable;
- **Logistic support** - to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.

The organization of biosphere reserves

To carry out the complementary activities of nature conservation and use of natural resources, biosphere reserves are organized into three zones:

- **Core area** - set aside for long term protection, human activity is limited to monitoring and research.
- **Buffer zone** - area surrounding the core areas helping to protect the environment. It may accommodate education and training activities.
- **Transition area** - may contain a variety of agricultural activities and human settlements. Here all stakeholders have to cooperate to achieve sustainable development.



In the Tonle Sap Biosphere Reserve three core zones have been established which cover an area of more than 42,000 hectares. Not only are they the least disturbed parts of the lake, but each has an individual character.



Prek Toal (Battambang Province)

Located in the upper reach of the Tonle Sap Lake, the Prek Toal core area is one of the most important breeding grounds for endangered species of large water birds. It covers 21,300 hectares.



Steung Sen (Kampong Thom Province)

Where the Steung Sen river flows into the Tonle Sap Lake an area can be found that is home to numerous endangered animal species. Also found here are unique flooded forests including a relative intact area of gallery forest. Steung Sen spans 6,400 hectares.



Boeung Tonle Chhmar (Kampong Thom Province)

Boeung Tonle Chhmar covers 14,600 hectares of open water and creek system. It is designated as an internationally important wetland. The area supports a large variety of plant, fish and water bird species, many of which are known to be rare, vulnerable or endangered.

Who Benefits From The Biosphere Reserve?

Biosphere Reserves are special places for people and nature. Everybody can benefit from the Tonle Sap Biosphere Reserve.

- **Local communities** benefit because the protection of basic land and water resources provides additional employment, more influence in land-use decision-making and a healthier environment.
- **Farmers, foresters, fishermen** benefit because biosphere reserves provide access to training and demonstration projects on alternative land-uses and management strategies which maintain natural values.
- **Government decision-makers and agencies** benefit because better information on natural resources enhances technical and institutional capabilities to manage natural resources in a sustainable manner.
- **Future generations of Cambodians** benefit because the protection of nature today assures that they can equally benefit from the rich natural values of the Tonle Sap Lake.





Tonle Sap Biosphere Reserve Secretariat

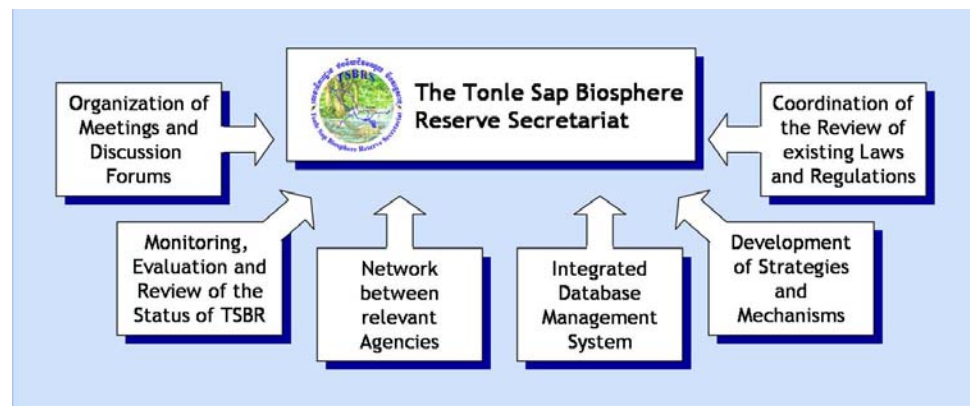
A central crossing point

The Tonle Sap Biosphere Reserve Secretariat is the crossing point between all stakeholders, fostering cooperation in solving natural resources problems, communication and knowledge exchange.

To reach the aims of the TSBR, cooperation is needed between scientists, national and local officials, representatives of national institutions and the local inhabitants. The TSBR Secretariat plays a major role in establishing this cooperation.

A partnership approach

To achieve sustainable development in the TSBR, the Secretariat facilitates a partnership approach among the relevant agencies and provides ongoing support to the partners.





The Tonle Sap Great Lake - A Masterpiece of Nature

The Vision

By 2020 the Tonle Sap Biosphere Reserve will be a productive and restored environment supporting biodiversity, conservation and sustainable development through internationally recognized management models, extension, training, environmental education, research and monitoring programs.

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