

# **The School** **in the Mangrove**



**ENVIRONMENTAL CONSERVATION**



**Khlong Phitthaya Longkorn School**

# The School in the Mangrove



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**Khlong Phitthaya Longkorn School** has the distinction of being the school located next to the only mangrove forest remaining in Bangkok. Through its environmental education, and awareness-raising and conservation efforts, the school exists in harmony with its environment, and is both beneficiary and guardian of the mangrove area.

Situated at the Upper Gulf of Thailand, the school has a unique geography. The area is covered with a fertile mangrove swamp, where rural life continues to thrive.



The main occupations of the villagers in the community are fishing and marine farming, namely, natural and semi-intensive farming of shrimps, mud crabs, blood cockles, mussels, and seabass. The inhabitants also produce by-products, such as shrimp paste, and fish sauce.

Recognised by various institutions from both governmental and the private sector, Khlong Phitthaya Longkorn School has received many awards for its passionate and committed efforts in providing education that takes environmental issues into account, and especially concerning the mangrove environment in its vicinity. The primary school instills environmental-protection consciousness among teachers, students, parents and the local community through its education programmes and curriculum, and by organising activities that benefit the school, the mangrove forest and environment, and the communities in the area.

Initiated by His Majesty King Bhumibol Adulyadej of Thailand, the Thai Ministry of Education awarded Khlong Phitthaya Longkorn School the Best Medium-sized Primary School in 1978, 1981, 2008 and 2012.

Among the other awards that the school has won include those received from the Rajapruek Institute Foundation for the school's achievements in raising



environmental and natural resources protection awareness among its students; from the Department of Health, Ministry of Public Health, for health promotion; from the Tarn Namjai Foundation for integrity and establishing itself as an example for other schools; from Honda Automobile (Thailand) in honour of the long-term commitment to the environment; from the Teachers' Council of Thailand for innovation; from the Bangkok Metropolitan Administration for the best non-toxic agriculture project and food safety; and from the Ministry of Agriculture and Cooperatives under the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn.

Khlong Phitthaya Longkorn School continues to develop projects that revive and sustain a mangrove forest next to it, as well as adopt the Thai king's philosophy of sufficiency economy as its principle in education and practice. As a result, the school has developed a National Sufficiency Economy Learning Centre, and has become a model and fine example for other schools in the country.







## History

Khlong Phitthaya Longkorn School is located in the Bang Khun Thian district of Bangkok. It is the only educational institution situated in what used to be a mangrove forest. Today, the area beside it is the last mangrove forest in Bangkok. The school has assumed the duty of protecting this remaining mangrove forest, and entrusted upon itself the responsibility to take care of it so as to ensure its survival.

The primary school, under the auspices of the Bangkok Metropolitan Administration (BMA), organises activities and develops

a curriculum that adopts an integrated approach to mangrove forest conservation. Activities include preparing mangrove seedlings for forestation in the school's area, and nurturing awareness in conserving the mangrove forest, the environment as well as the natural resources among the students, their parents, and the community. In the process, natural resources from the mangrove forest are used sustainably and for the greatest benefit of the community. For example, the shells of *Xylocarpus* fruits are used as dye on fabric, clothing, etc..





## The School in the Mangrove



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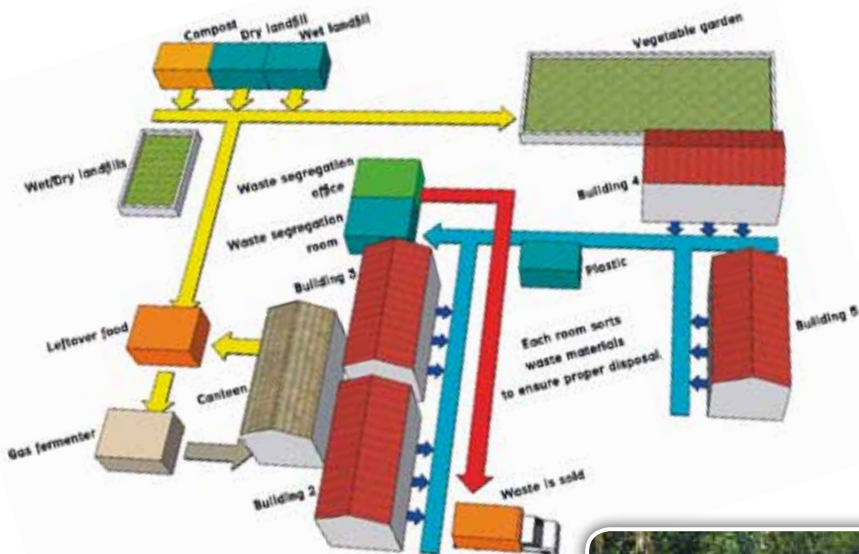
The learning activities of the school are very much oriented toward environmental conservation and maintenance of the mangrove area. Activities relating to the mangrove are integrated in all study subjects. In developing its own curriculum that is adapted to its environment, the school adheres to six elements of the philosophy of sufficiency economy espoused by the king of Thailand:

- Self-reliance
- Optimisation of existing resources
- Making the school a place of learning, and mutual understanding between teachers and students

- The virtue of saving money, and reducing personal expenses
- Integrated management
- Appreciation of the value of sufficiency

The local curriculum includes the following:

- Farming of marine life forms, such as crabs, mollusks and seabass fish
- Dyeing
- Mangrove planting
- Understanding community practices/ local ways of life
- Mangrove forest ecosystem



**Process flow diagram of the school's waste separation and disposal**  
**Wet waste is fermented to produce biogas for cooking. Some of the dry waste can be sold.**



## Environmental conservation activities

Environmental awareness and knowledge are cultivated among the students and the community at the Khlong Phitthaya Longkorn School. In seeking learning resources, the school management constantly analyse the school's environment to develop the learning process and create knowledge that can be applied in daily life.

The management also engage in energy conservation, water, agriculture, and career development. Its projects include generating energy from biogas (animal dung and unconsumed/abandoned food), water use campaigns, reuse of wastewater, organic and marine farming.

Other activities that focus on preserving the mangrove area next to the school include collaborations with governmental agencies and the private sector, such as planting mangrove seedlings in forestation

projects, and accommodating group visits (for study of mangroves).

Administrators and teachers at the Khlong Phitthaya Longkorn School take the lead in guiding students in the efforts to preserve the environment through practical activities, such as the following projects:

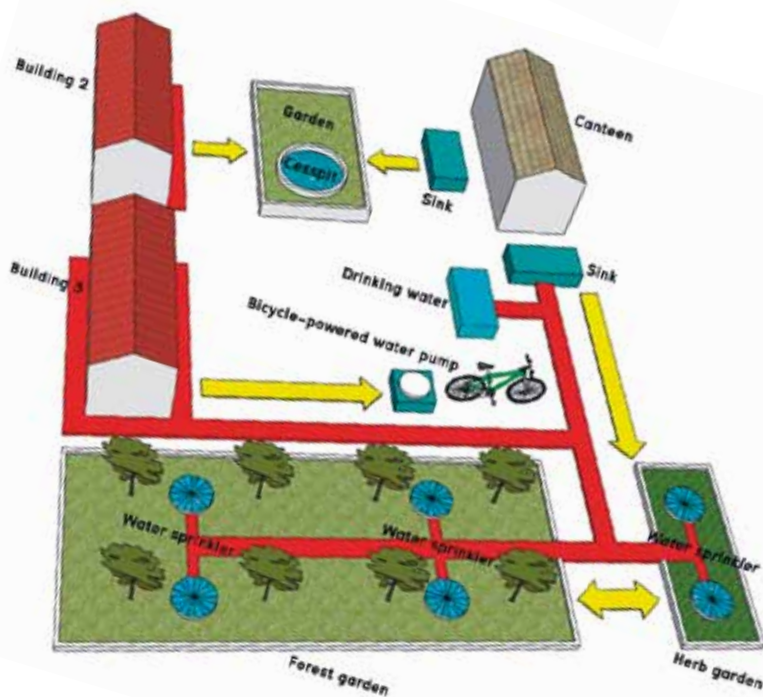
- Electricity-saving measure: adopting wind (windmills) and solar energy (solar cells that store sunlight) instead of electricity.
- Gas-saving measure: using biogas (from effective management of waste) for cooking activities at the school.
- Water-saving measure: water-saving campaign; wastewater treatment system (water reuse on gardens); using a water pump system to water plants by generating electrical energy from the mechanical energy of students riding on stationary bicycles.



Process flow diagram of the canteen's wastewater treatment and recycling for watering plants

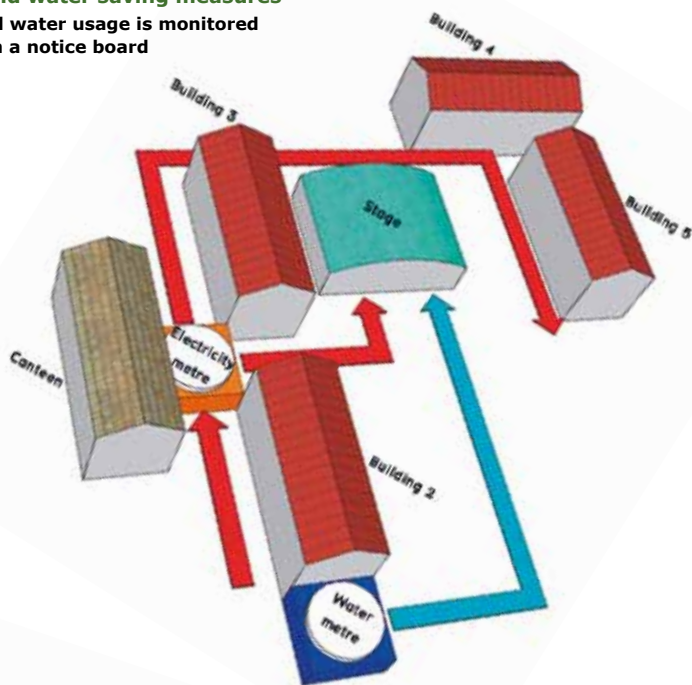


Process flow diagram of the wastewater treatment system showing the recycling of water for irrigation and the use of bicycle-operated water pump

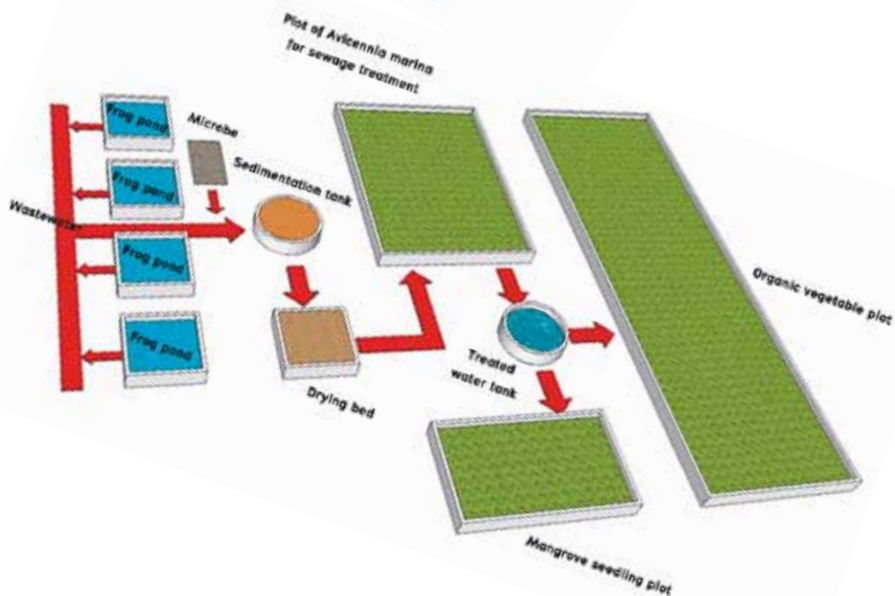


**Diagram showing the school's electricity and water saving measures**

Electricity and water usage is monitored and shared on a notice board



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**An application of Avicennia marina in wastewater treatment**

Wastewater from ponds flows through pipes into a sedimentation tank and goes to an Avicennia marina plot for treatment. Treated water is stored in a tank before being used for watering vegetables and seedlings.





## The School in the Mangrove

As Khlong Phiththaya Longkorn School is situated near land and water boundaries of three provinces (Samut Prakan, Bangkok and Samut Sakhon), it is also an attraction for eco-tourism. Tourists visit to ride bicycle, hike, take nature-walks, or enjoy a boat trip along the canals that connect the three provinces. The other attractions in the area are the Mon community in Bang Kradi; coastal fisheries of Samut Prakan, and the Pantai Norasingh Memorial Shrine, a local legend of Samut Sakhon province.

The school runs a project (Ahsa Pha Tiao) training students as volunteer guides for tourists in the area. The project aims to provide the students knowledge on the mangrove forest, and by extension increase the public environmental awareness.

A 1.7-kilometre-long wooden bridge into the forest, punctuated by pavilions along the way, facilitates the study of nature, and allows visitors to appreciate the forest eco-system and sustainable mangrove conservation.

The project also benefits the students in providing outdoor study, and improves the quality of leadership among them. Parents support and participate in the activities, together with their children. Members in the community welcome the activities as they earn from selling products from coastal fisheries to tourists. Due to the local media's coverage, Khlong Phiththaya Longkorn's student-guided tour has become better known in the country, and among eco-tourism operators.

## School Environment

### Mangrove plants

This mangrove in the Bang Khun Thian area at the Khlong Phithaya Longkorn School is over 11 hectares. It is promoted by the Bangkok Metropolitan Administration (BMA) as a tourist and educational site where one can learn about the mangrove ecosystem.



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Fringe forest covers the school area. This type of fertile forest, growing along coastline adjacent to the mainland or at the coast of a large island, benefits from the effects of sea water. Mangrove swamps in Bangkok have, however, decreased more than twofold, partly due to the fact that people made use of their land by turning it into shrimp and salt farms, communities expanded, and climate change has exacerbated coastal erosion.

The mangrove forest, if rehabilitated and taken care of so that there remain fertile plants and animals, would be one of Bangkok's largest greenhouse gas-absorbing areas (according to a biodiversity survey of the Bang Khun Thian area).

There is a variety of flora in the Bang Khun Thian mangrove forest:

- Trees include *Avicennia marina*, *Rhizophora mucronata*, *Rhizophora apiculata*, *Bruguiera gymnorhiza*, and *Thespesia populnea*.
- Shrubs that are widely found include *Solanum trilobatum*, *Suaeda maritima*, and *Pluchea indica*.
- Vines include *Sesuvium portulacastrum*, *Boerhavia diffusa*, and *Azima sarmentosa* (Blume).
- Ferns such as *Acrostichum aureum*.





## Mangrove animals

There are many animals, including benthic animals, marine animals, birds, and many other types of animals in the mangrove swamps.

The density of benthic animals is between 249 and 1,340 animals per square metre, and most of them can be classified into three groups, namely:

- Polychaetes
- Small crustaceans
- Molluscs, especially *Assiminea brevicula*

The diversity of marine and other animals is high. Those that are scarce or almost extinct in the area include the Green tidal crab, Grouper, Giant tiger prawn, Mud creeper, Pacific oyster, Red crab, Grey-eel catfish, Jagor's water snake, and Old World otter.

There are also a variety of both resident and migrant birds, for example, Brown-headed gull, Little egret, Pond heron, Black-capped king fisher, and Large-billed crow.





# Products from the mangrove



## Products

Some of the products generated by the school's environment-friendly education and activities using mangrove and forest resources are as follows:

- Indian Camphorweed (*Pluchea indica*) herbal tea
- Sea Blite (*Suaeda maritima*) plant used in local staple food
- Salted eggs
- Fabric dye from *Xylocarpus* fruits



## Background to Development of the School

Historically, the Cooperative Promotion Department transformed the area (where the school now sits) into a Nihom Sahakorn ("Sahakorn" is a cooperative or co-op) zone called Sahakorn Community, which was allocated agricultural plots for sea salt and shrimp farming. The community residents called themselves the "Sahakorn" people. It expanded as more people moved into the community, and a local school was constructed.

Khlong Phitthaya Longkorn School was founded in 1958 on approximately 0.16 hectare of land that was given by the Cooperative Promotion Department. The school received financial support from the local community to build a one-storey-high school building that was

named the Sahakorn Nihom Naklua School.

In 1958, the Education Commission requested the Cooperative Promotion Department to grant 82 rai of land to expand the school area, and develop the institution. It was renamed Khlong Phitthaya Longkorn School in 1971.

The school is dedicated to the education of children from Kindergarten to Primary Education Grade 8. There are 520 students in total.

School personnel include 24 teachers, 4 baby sitters, 1 administrative officer, 5 cleaners, 1 boat driver, and 1 gardener.

## Awards

Awards received by the school include:

- Honda School Environmental Challenge V Award (2008, 2010 and 2012) organised by Honda Automobile (Thailand) in honour of the King's long-term commitment to the environment
- Gold Medal for Health Promotion (2009), awarded by the Health Department, Ministry of Public Health
- Green Box Project Award (2008) from the Rajapruek Institute Foundation for instilling awareness in protecting the environment and forest resources among its students
- Best Non-toxic Agriculture Project Award (2007) from the Education Department, Bangkok Metropolitan Administration (BMA)
- Outstanding School in Food Safety Award (2007) from Health Department, Bangkok Metropolitan Administrator



Khlong Phitthaya Longkorn School also received the Royal Award for the Best Medium-sized Primary School in 1978, 1981, 2008 and 2012.

It was initiated by His Majesty King Bhumibol Adulyadej, and given by the Ministry of Education. The award is given to schools that are outstanding in the academic field, educational management, and other areas.



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- Promote the preservation of environment, art, culture, tradition and local cultural mores
- Promote quality of life based on a self-sufficiency way

## Visions

- Enhance education based on Buddhism and learner-centred approach
- Adhere to the philosophy of sufficiency economy
- Integrate local wisdom
- Preserve the environment
- Promote technological development

## Missions

- Enhance and promote discipline, integrity and morality
- Improve and promote learning skills so that students are creative and eager to learn
- Apply modern technology effectively

## Goals

With the above visions and missions, the school aims to achieve the following goals in pursuit of its educational development plan:

- Students are knowledgeable and analytical, healthy, eager to learn and develop skills, appreciate the value of work, have integrity, behave morally, and have aesthetic appreciation in art, music and sports.
- Teachers are able to efficiently meet diverse learning management requirements by focusing on learners.
- The school integrates the local community, school committee, teachers and parents with its management system.

## Public Interest in the School

There has been growing publicity and interest in Khlong Phiththaya Longkorn School and the mangrove forest. Many TV channels have broadcasted programmes on the school, such as:

- Kids Ranger: Beloved Mangrove (2011, NBT)
- Highlight Thailand (2012, Channel 5)
- Guru Ku Aroi (2013, Modernine TV)

Some of the following websites also provide publicity on the school:

- [Thaipost.net](http://Thaipost.net)
- [SCB foundation.com](http://SCB.foundation.com)
- [CSRthailand.net](http://CSRthailand.net) (Corporate Social Responsibility Thailand)
- [Manager.co.th](http://Manager.co.th)
- [Livingculturalsites.com](http://Livingculturalsites.com)
- [PR.KU.ac.th](http://PR.KU.ac.th) (Office of the Public Relations, Kasetsart University)

## Institutions' Support and Contributions to the School

In various ways, support for Khlong Phiththaya Longkorn School came from several organizations, such as:

- Royal House Co., Ltd.
- Bangkok Metropolitan Administration together with Honda Automobile (Thailand) Co., Ltd. and Seub Nakhasathien Foundation
- MFC Asset Management Plc

Each year, representatives from various institutions visited Khlong Phiththaya Longkorn School to observe and participate in mangrove-related activities, such as mangrove planting, eco-tourism, and mangrove ecosystem studies. The groups included universities, colleges, primary schools, governmental and non-governmental organizations, and private sector companies.

### Participants of the 3rd Asian Mayors Forum (AMF)

On 30 November 2012, participants of the 3rd AMF, namely representatives of mayors and municipal authorities from Asian cities who participated in the forum held between 28 and 30 November 2012 at Plaza Athénée Bangkok Hotel, visited Khlong Phiththaya Longkorn School's marine farming project and mangrove garden.

### Thai major students (fourth-year) from the Faculty of Education, Suan Sunandha Rajabhat University, Thailand

On 2 March 2012, fourth-year Thai major students from the Faculty of Education, Suan Sunandha Rajabhat University carried out a project, Learning the Local Wisdom through Local Ways of Living, at Khlong Phiththaya Longkorn School. The aim was to study and preserve local wisdom, providing students the opportunity to learn local ways of living in the Bang Khun Thian communities; visit the Museum of Local Wisdom; and engage in activities such as cloth-dyeing using colours from *Xylocarpus* fruits' shells; and planting mangrove trees.



### The Red Cross Youth, Thai Red Cross Society, Thailand

More than 70 Red Cross Youth Volunteers from schools in Bangkok participated in a mangrove-planting activity at Khlong Phiththaya Longkorn School on 25 June 2011 to instill consciousness in conserving the natural environment.





### **Matthayom Wat Thatthong School, Thailand**

Teachers and eleventh-grade students made a mangrove ecosystem field trip at Khlong Phitthaya Longkorn School on 30 July 2010.

### **Environment & Nature Activity Centre (ENAC), Thailand**

Families were brought to visit and study the mangrove forest at the school on 20 February 2005 under the project, Nature Learning Camp: a Joyful Day at the Mangrove.





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**The school has  
assumed the duty  
of protecting  
the mangrove**

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