

Bathing in the Chao Phraya

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Anyone who has taken a boat ferry up the Chao Phraya river, perhaps en route to the Grand Palace, or taxied across to one of the scenic riverside dining locations, knows that the Chao Phraya appears to be full of pollution. Even worse are the canals, where getting splashed by the seemingly near-toxic liquid could not only gross you out but also ruin whatever it is you are wearing. In keeping with our series on pollution, for the next few weeks we will dive into water pollution by taking a look at the current state of Bangkok's waterways and the regulations in place to combat further contamination.

The state and quality of water and waterways in Thailand are not governed by a single piece of legislation, but rather an entire cluster that addresses water pollution from many angles. Primarily, the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992) is used to regulate the sources of wastewater, such as factories, that dump wastewater directly into the public waterways or the environment by proscribing specific effluent standards. This Act and its related Ministerial Notifications regulate which types of factory businesses must treat their wastewater before dumping it and sets limits for a list of harmful metals, toxins, and other chemicals to ensure that that which is being put into the environment is not dangerous to those who rely on the surrounding waterways and/or environment. This Act also works in conjunction with the Factories Act, also passed in 1992, which restricts the concentration levels of chemicals and metal pollutants in wastewater being dumped into the environment.

Under Section 69 of the Act, the owner or possessor of the source of pollution has the duty to install an on-site facility for wastewater treatment or waste disposal, as determined by the pollution control official. There is an "Environmental Fund" whose moneys come from a tax on gasoline (as discussed in previous articles) that is designated for, among other things, investment and operation of wastewater treatment plants and waste disposal facilities by local administrations or state enterprises. Moneys from this fund can also be allocated as loans to private persons in the event that they have a legal duty to install an on-site facility for wastewater treatment.

The Navigation in Thai Waterways Act (as amended in 1992) and the Public Cleanliness and Orderliness Act B.E. 2535 (1992), both prohibit the dumping of refuse into rivers, canals, and other waterways. The Public Health Act regulates the nuisance activities related to water pollution such as such as odor, chemical fumes, and the wastewater discharge systems of buildings, factories or animal feedlots that cause harmful health effects. This Act was again passed in 1992, which was a year in which a military coup took place. The appointed Prime Minister, Anand Panyarashun, initiated a number of progressive environmental protection laws almost immediately upon entering office.

While there are a number of ministries that address water in various capacities, the regulators of water pollution are the Pollution Control Department and the Department of Industrial Works. The Pollution Control Department is responsible for the management of overall water quality and for the control of wastewater discharge. Wastes from industries are controlled by the Department of Industrial Works and the Industrial Estate Authority of the Ministry of Industry. Wastes from agriculture are controlled by agencies under the Ministry of Agriculture and Cooperatives. The local governments control domestic waste.

International standards for monitoring the quality of water test for five different factors. They are:

-Dissolved Oxygen (DO): how much oxygen is available in the water for aquatic organisms (a high DO level is good)

-Biochemical Oxygen Demand (BOD): the amount of oxygen consumed by bacteria while decomposing organisms in water (a high BOD is bad)

-Total Coliform Bacteria (TCB): level of bacterial contamination from human waste

-Fecal Coliform Bacteria (FCB): level of contamination likely to harbor bacteria that cause digestive diseases

-Total Ammonia (NH₃): the amount of nitrogen in the form of ammonia (a high level is bad)

So, how does Bangkok score? Well, due to its size, the Chao Phraya is the cleanest public waterway in Bangkok, and according to the 2011 Thailand State of Pollution Report compiled by the Pollution Control Department, around 70 percent of tested areas met national standards for (DO) and (BOD) whereas only slightly over 50 percent of tests met national standards for (NH₃).

However, the most surprising (and disgusting) statistics were for TCB (46 percent of tests passed) and FCB (29 percent of tests passed). Remember that these are the two tests that measure the amount of human waste and bacteria that cause gastrointestinal illnesses in the water. Looking at the raw data, the Chao Phraya averaged 24,000 mpn/100ml in TCB tests and 7,900 mpn/100ml in FCB tests.

As a comparison, the US Environmental Protection Agency set contamination standards well below those levels, finding that water above the thresholds of 2,300 mpn/100ml (TCB) and 400 mpn/100ml (FCB) were associated with gastrointestinal illnesses; the actual "safe" standards imposed by the EPA are considerably lower than these. This means that the amount of fecal matter and accompanying harmful bacteria in the Chao Phraya River is over ten times higher than the threshold that the US EPA has determined causes digestive illnesses. Perhaps ingesting Chao Phraya River water in Bangkok is probably a greater risk to your health than getting on the back of a motorbike taxi during rush hour. What is the cause of all this pollution? We'll answer this question next week along with a look at some famous water pollution cases in Thailand.

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