

WATER POLLUTION IN THAILAND



INTRODUCTION



In recent years, the influence of population growth, agricultural, industrial, urbanization, and economic expansion in Thailand are continuing to harm the country's water quality in many water sources including surface water, groundwater, and seawater. It is reported that one-third of the surface water is of poor quality in Thailand. On top of that, because of urbanization, especially in the center of economic development areas, there is an increase in water demand significantly, estimated to be growing at about 20 percent a year. Therefore, urban expansion directly affects the utilization of natural resources and economic development. In some areas, the water demand already exceeds natural supply and a growing number of the population are expected to face water shortage in the near future (Thailand's domestic water supply system is generally provided by two agencies: the Metropolitan Waterworks Authority (MWA) and the Provincial Waterworks Authority (PWA). The MWA is responsible for the production and distribution of potable water in the Bangkok metropolitan region, while the PWA is responsible for water source development, treatment, storage, and distribution to all the urban and rural communities in the provinces). Water consumption and water demand in urban areas and other regions in Thailand are important issues for sustainable water management. In Thailand, government policy also emphasizes economic growth along with the expenses of available natural resources, especially water resources.

In fact Thailand's water is in crisis as the quality of water across the country is still poor and some below the standard for consumption. Moreover, as there are many pollutant factors like households, firms, and government, it is inevitable to cause a clean water shortage for agriculture, industrial activities, and risk of human health. Furthermore, besides the problems on water quality for domestic use, there are the concerns of the water pollution and habitat degradation of marine life through the contaminant substances or non-recyclable plastic which later have a chance to directly affect people's health as marine life is also one of the food sources of humans. In addition, water scarcity is a global threat that is estimated to hit Thailand hard by 2025. The country must develop a long-term plan to manage these challenges. Effective water management needs to be implemented in Thailand, to ensure the water supply and quality are enough to support people's high demand.



WHAT IS WATER POLLUTION AND

Water pollution is water contaminated with different resources such as chemicals, microplastic and microbiological. Water pollution in Thailand also comes from many places such as the domestic, private sector, and agricultural sectors. The Pollution Control Department states that water pollution across 65 places makes the high-quality water lower than 40 percent.



WHY WE NEED TO PAY ATTENTION

We should take the problem seriously due to the importance of water. Water is a major resource for humans and animals. It also is an origin of aquatic animals and plants. Moreover, It also benefits household consumption such as doing laundry, mopping the floor, and drinking. In daily life, people consume 1.5 liters to maintain the water balance in the body. Some use water in agriculture to grow plants such as rice which is the main product we consume every day. It also is an aquatic animal habitat.

These are examples that represent why we need to pay attention to the water pollution problem

- The Red tide
- The coral bleaching

Normally red tide can emerge during the rainy season to winter season. However, the red tide increased dramatically. Red tide emerged from the water pollution. The water is contaminated with chemicals from agriculture which contain phosphorus that speeds the increase of sewage. This phenomenon affects the sea environment because when the sewage cover surface of the sea leads to the coal and other plants can not photosynthesis. Then, The lowering in oxygen caused the death of aquatic animals and plants. So, the root cause of the red tide is water pollution

Water pollution polluted by sunscreen or releasing water waste is one of the factors that are a cause of coral bleaching. The bleached coral is a coral without the algae which are the main sources of nutrients. Then the coral turns white and is more sensitive to illness. This phenomenon directly affects marine life because The coral is an important ecosystem for life underwater such as being a habitat and source of nutrients for life underwater. Moreover the coral can absorb carbon. So, marine life loses both habitats and nutrients. Then, It affects our life cycle as well.

For example Surin island is affected by coral bleaching. And have to close the island for the recovery. Snorkeling businesses at Surin island don't receive income during the shutdown.

As you can see, water pollution creates many problems in a wide area. It affects the environment and also the economy in the country. If we want a sustainable life we should pay attention



**Water
is the
driving
force
of all
nature.**

POLICY LINKS

Water pollution management in Thailand

The following section will examine water policies in three different areas including government, household individual(s), and private sector in regard to the scale of each group. Additionally, policy recommendations are to be introduced in the next part.



No. 01 – Government

1.1 Laws and regulations

Government plays vital roles in regulating country's laws. Likewise, it is anticipated for officials to prohibit actions that lead to risk of polluting water, and to provide remedies for water to the most prominent degree as a part of development plans. According to the National Economic and Social Development Plan for 2007-2011, one of the approaches is 'Command and control'. This policy stated that disposal of wastes should be monitored at the origin by the Pollution control department (PCD). As a result, specific areas such as agricultural areas, industries, and buildings had to operate under emission standards. Subsequently, acts were enforced in complement to the waste disposal, and they were derived from market-based instruments. For instance, government or municipal authorities shall provide particular places for waste disposal where they were under surveillance. Hence, the government ought to secure water treatment plants for each of the water disposal points, and in every densely-reported polluted water source.

1.2 Economic instruments

Subsequently, government officials hold authority to tax and subsidies whereas they could be seen as economic tools to incentivize players in the economy to acknowledge their involvement in water pollution. Namely, officials may discourage wastewater disposal by implementing a 'pollution cap' in which the amount of effluent is limited. In contrast, officials may subsidize (e.g., decrease tax) private sectors that produce water management instruments, or firms that have water management program: for example, subsidizing a grease trap and wastewater treatment pond, and instructing financial institutions to give special credit to firms who submitted environment plan for their business operations.

1.3 Promote positive participation

Since government alone is unable to accomplish in a broad extent, they should promote public participation or voluntary participation. In addition, the government could form partnerships with private sectors in order to integrate the environment plan into the model, and offer business benefits in return. The participating parties could support the public sector in monitoring, and raising awareness among their communities. Nevertheless, the government may utilize the municipal system in local water sources management where the system depends on communities' attention to their environment.



No. 02 – Household (Individuals)

2.1 Provide information and create awareness

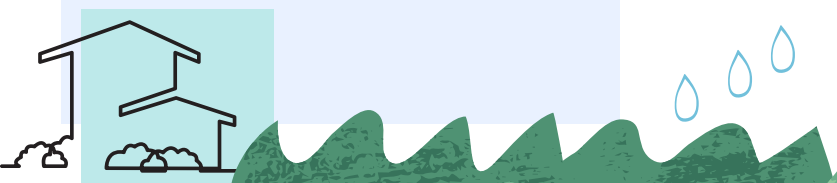
Individual could cause a large impact to the environment in either positive or negative ways since they are one of the sources of pollution; for instance, pouring oil into drainage, using non biodegradable laundry detergent pods, and disposing waste into water pipe; so, consciousness should start at the smallest unit. Mostly, a community has an advantage in creating participation. The reason is that individuals would have stronger motivation as a group. They are able to monitor bodies of water near their surroundings and receive information on water pollution. However, detached house could also be a large aid as well by refraining from any polluted activities as well through raising awareness among each individual.

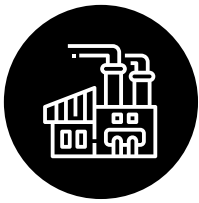
2.2 Legal support

It could be done through providing incentives for individuals to take part since there are a great number of water pollution that was ignored because there is no proper place to file a complaint. Consequently, legal authorities such as local police station, or a pollution control department should publicize the water-polluters-reporting policy to encourage people to call out any actions that harm water sources. Furthermore, authorities may begin a complaint line to ensure that individuals would feel safe and secure in reporting pollution crime. At last, it is important to enforce legal punishment (e.g., fine) and officially recognize the reporter (e.g., giving monetary reward).

2.3 Reuse greywater

Greywater is defined as domestic wastewater excluding flushing water (e.g., baths, sink water, and laundering); so, it could be reused in toilet plumbing and watering plants. People could be incentivized by its benefits: saving water, saving cost, and building natural water cycle flow.





No. 03 – Private Sector

Apply the “polluter-pay” principle

Polluter-pay is the policy that the government imposes tax on any private sector who creates pollution. This policy works by setting the criteria of tax imposed depending on the amount of pollution each firm creates. Since the production process not only releases much chemical and toxic substance to the environment but also releases the contaminated water to the river. In addition, firms always want to maximize their profit so they do not want to pay for any additional payment which can be the way to encourage firms to be more concerned about the environment. For example, In 2002 Ireland introduced a tax on plastic bags especially on department stores. This resulted in reducing up to 90 % of plastic usage and plastic waste.

Water pollution cap

Besides putting a tax, cap and trade is also one of the ways. Water pollution cap is the policy which incentivizes firms with an income that they can get when they produce less pollution. The government gives the credits to each firm when the firm produces less pollution than the quota they can sell it to the other firm. This encourages firms to produce as less pollution as they can so that they can earn more money.

Submit action plan

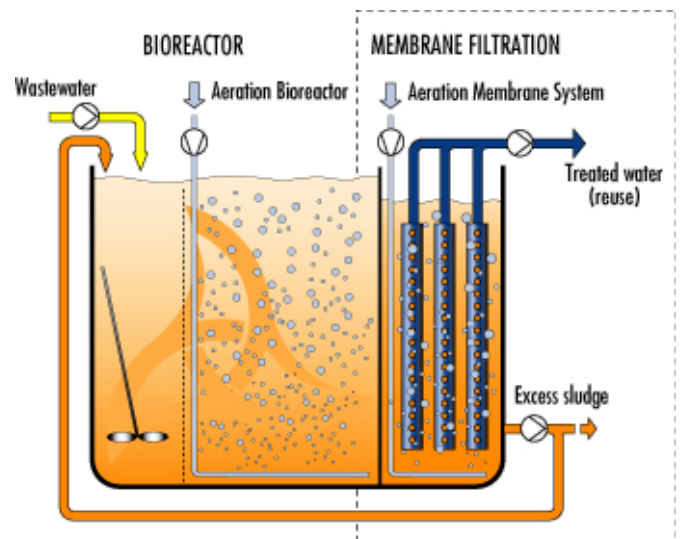
Firms must submit the action plan to the National Environment board which includes how to prevent or moderate creating pollution and ways to do water treatment since industry releases much pollution each year. This policy objective is to ask for the companies' help in doing a water treatment before releasing them to the water way and find a way to prevent creating pollution or produce as less as possible. Moreover, this aims to make the companies help save the water as much as possible, for example reusing the water in the toilet to water the plant.



Policy recommendation

Public private partnership

Public private partnerships is a cooperation between public sector and private sector. In this cooperation, the public sector is the owner or as known as state owned enterprises and the private sector or firm gains profit from that. Membrane Bioreactor (MBR) is a new innovation combining biological treatment and membrane filtration together. The membrane filtration has a tiny porous which helps filter the sewage in the water better. This technology can clean the water faster, cleaner, and the body of the machine is smaller than other sewage machines. This is developed to be suitable for recycling the water in the building, community, company, and household as well. With this technology and water shortage, Singapore plans to deal with ABB company for installing the huge MBR in the tunnel to purify the water and recycle water in the country.



CAUSES AND EFFECTS

No. 01 – Government Sector

One of the reasons that causes water pollution in many countries is Government failure. The government fails to manage different production sectors, fundings, and also gives too many subsidies for a specific type of production. These government failures could be seen where they have given too much tax reductions for firms and give the firms more incentive to produce. For example, when there is an increase in production, there is also an increase in waste. Because of the lack of government involvement and lack of water management equipment, the waste could not be managed properly. Also the government doesn't have a lot of projects that support environmentally friendly transportations. This causes the river to be polluted by the oil that is released from ferry boats and eventually leads to more waste being released into the environment and bodies of water such as the Chao Phraya river. The effects that are caused by this include the people living alongside the river won't be able to use the river water for consumption anymore. Since the people living near rivers are mostly low income families, their main source of income might be fishing or growing vegetables that require clean water. Therefore, they will be affected by the polluted rivers. The community may be forced to live somewhere else and could lose part of their income.



No. 02 – Households and Individuals

Households and individuals could be a part that contributes to the water pollution in Thailand. The households and individuals use different types of plastic and waste that are not disposed properly. The excessive use of detergent and water could also contribute to the increase in water pollution. When individuals use detergent, it contains chemicals such as bleach and phosphate that increase the chemicals level in water. This also interferes with the ecosystem within the water too. The effects of chemicals create water pollution in different bodies of water in Thailand. Because phosphate has the ability to destroy living organisms, which decreases the level of oxygen. The ecosystem within the water would not be able to survive such as fish and algae that help balance out the food chain.



No. 03 – Private Sector

The private sector such as different agricultural firms also contribute to most of the water pollution in Thailand. According to the news, it was stated that in 2016, 39 million cubic meter of waste water was dumped into different rivers in Thailand per day, and most of the waste is from the agricultural sector. Because of this, the waste polluted the river causing people to move away from the area. Industrial sector is the second highest with 17.8 million cubic meter per day, and lastly, the residential area with around 3.5 billion cubic meters per day. When companies release industrial waste into the water, people around the area couldn't live there and need to be moved to other places. Animals and plants in the area might not be able to survive due to the chemicals. Moreover, the chemical waste could also create diseases for the people living around the area.



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