

# Environmental Problems and Green Lifestyles in Thailand

by

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## Abstract:

There is widespread acceptance that more and more irregular environmental disasters have occurred frequently than ever in every corner of the earth. On 11 March 2011, the catastrophic 9.0-magnitude earthquake hit Japan so heavily which caused devastating tsunami ensuing Fukushima Daiichi Nuclear Power Plant radiation. This kind of unprecedented multi-disasters just happened before our eyes. There is no doubt that these current extreme environmental problems are feedbacks and also warnings from the nature. The Kingdom of Thailand, one of the fast industrial growing countries in South East Asia, has faced increasingly serious environmental degradation as follows:

- 1) **Climate Change:** flooding, drought, higher temperature, and sea level rise.
- 2) **Intensive Farming:** pesticide, herbicide, fertilizer, and irrigation.
- 3) **Water Pollution:** urban runoff, ship transport, untreated sewage, septic tank, animal dung, manure spreading, acid rain, and eutrophication.
- 4) **Air Pollution:** transportation, factories, burning forest, air plane, petrol station, smog, slash and burn.
- 5) **Resource Depletion:** overfishing, deforestation, water crisis, land degradation, soil desertification, habitat destruction, and biodiversity loss.
- 6) **Waste Generation:** e-waste, medical waste, household waste, industrial waste, marine debris, river dumping, and landfill.

As we can see, widespread environmental problems influence the lives of Thai people every year. Environmental degradation has been an enormous challenge for Thai government. In order to raise public awareness of environmental protection in Thailand, Thai Government should spend more money on educating Thai people and providing classes in environmental literacy because public education is always the most effective tool to arm people with knowledge about the ways of how to protect environment. In order to tackle the challenges of environmental degradation and achieve greener and cleaner environmental goal, Thai people should rethink of the emergency of environmental protection and make green lifestyle choices start from rethinking, reducing, reusing, recycling to responsible.

**Key Words:** Environmental Problems, Green Lifestyles, Thailand

## Introduction

The Kingdom of Thailand located at the geographical center of Southeast Asia surrounded by the Andaman Sea and the Gulf of Thailand. Thailand is bordered with Lao PDR in the north, Myanmar in the northwest, Cambodia in the east, and Malaysia in the south. Thailand could be divided into four regions according to the geographical location:

- ❖ **Northern Thailand:** Chiang Mai was a former capital of the Lanna Kingdom with numerous ruins and temples. Northern Thailand is the intensive farming area where faced two kinds of environmental problems: loss of agricultural land and deforestation due to illegal logging.
- ❖ **Central Thailand:** Bangkok is the capital city of Thailand surrounded by the famous Chao Phraya River. With the rapid tourism industry development, Bangkok was ranked “the 2010 World Best City” by Travel + Leisure Magazine. On the other hand, larger numbers of people and more traffic congestion cause more air pollution here.
- ❖ **Eastern Thailand:** Pattaya is a famous tourist destination and attractive to many foreigners from Europe or other western countries. Therefore, how to remove and clean seaside rubbish and garbage becomes a big problem.
- ❖ **Southern Thailand:** Hundreds of kilometers of coastline and countless islands among which Phuket is the largest island in Thailand. Surrounded by the Andaman Sea and Gulf of Thailand, people in Southern Thailand are suffering frequent flooding and infrequent tsunami.

**Figure 1: Thailand Geographical Location**

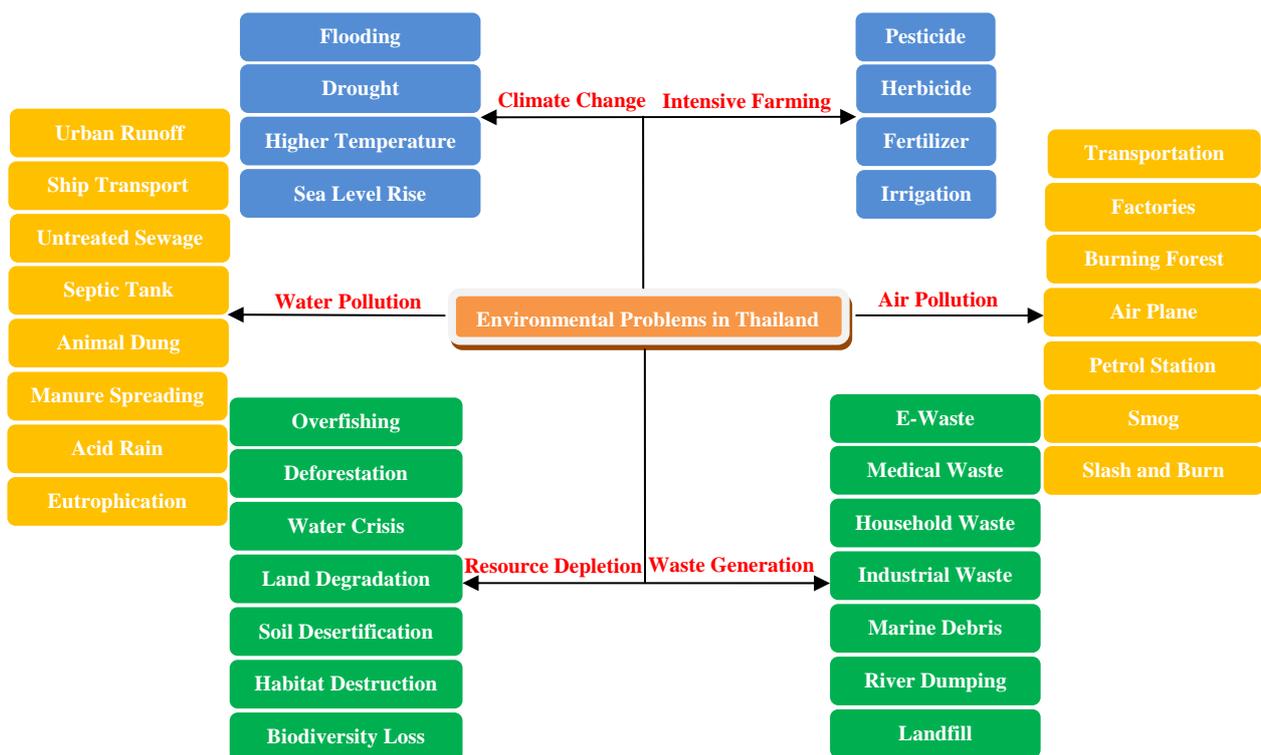


(Source: World Desk Reference. (2004). *Thailand Introduction*)

## Part I Environmental Problems in Thailand

Thailand is one of the largest economy powerhouses in Southeast Asia but at the same time the rapid industrial development has also led to some serious environmental problems threatening the survival of people in Thailand. For the past few decades, environment in Thailand has become more and more troublesome, as Thailand has been transforming from a traditional agricultural country to an industrial development country. There are six specific environmental problems in Thailand including climate change, intensive farming, water pollution, air pollution, resource depletion, and waste generation.

**Figure 2: Environmental Problems in Thailand**



### Climate Change in Thailand

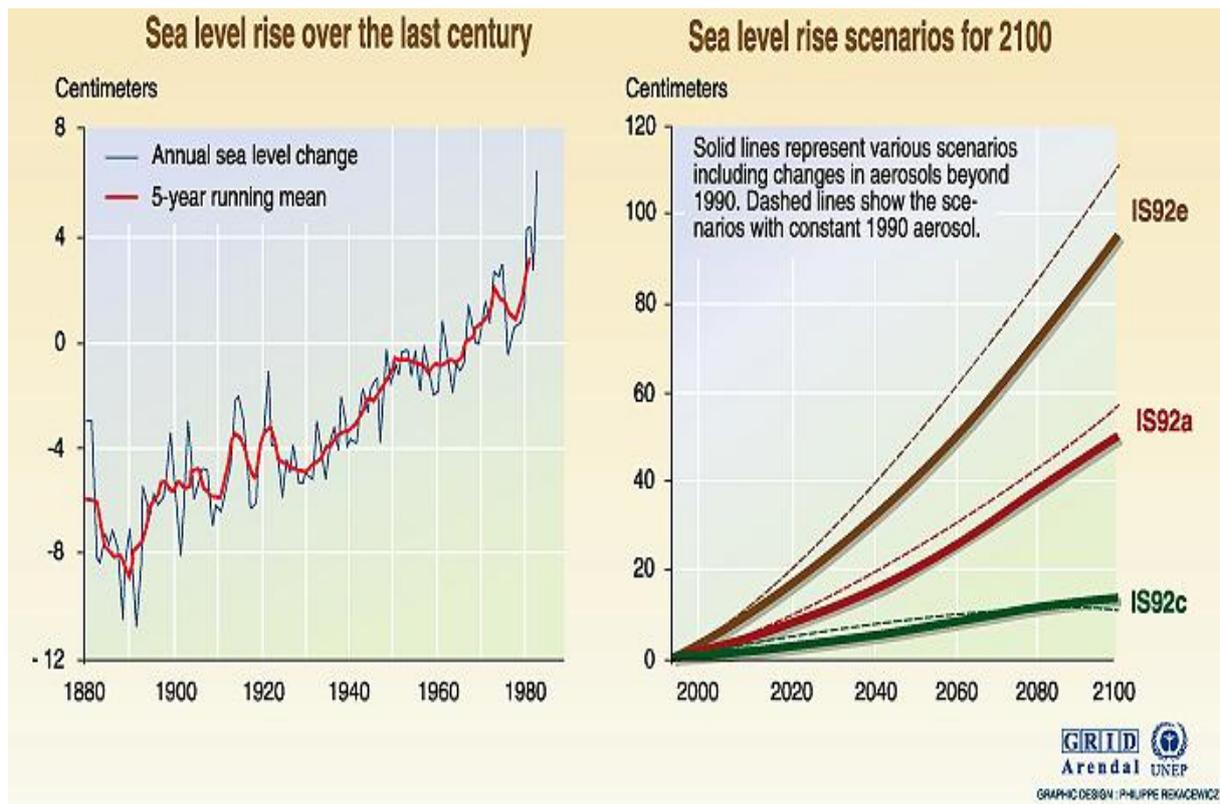
It has been raining severely in the last couple of months in Thailand. Thai people have to bring umbrella or raincoat whenever they go outside. Torrential rains caused heavy flooding in southern Thailand and even capital city of Bangkok. Ron (2009) reported “*the flooding threat to Bangkok comes from three factors, especially during the monsoonal season. Heavy rains could combine with high tides and runoff from the north into the Chao Phraya River.*”

Ironically, we still remember drought emergency in 2010 which threatened farmers whose survival depends on their rice harvest and water supply. Therefore, last year rice production in Thailand was hurt heavily by dry weather along the Mekong River area. Researcher Corinne (2008) warned that “*the effects of climate change, including higher surface temperatures, floods, droughts, severe storms and sea level rise, put Thailand’s rice crops at risk and threaten to submerge Bangkok within 20 years. The damage to agriculture, coastal tourism,*

*and the capital city as consequences of climate change will have enormous economic, cultural and environmental impact.”*

According to UNEP and ARENDAL GRID (2011), we are experiencing unprecedented global warming over the past 100 years. Figure 3 clearly indicated that the global sea level has risen by about 10 centimeters over the last century. Sea level rise scenarios for 2100 give us a terrible future picture. Sea level rise due to the higher temperature might be the biggest potential disaster, especially for southern Thailand surrounded by The Gulf of Thailand and Andaman Sea.

**Figure 3: Sea Level Rise due to Global Warming**



Source: Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1995; Sea level rise over the last century, adapted from Gornitz and Lebedeff, 1987.

## **Intensive Farming in Thailand**

Traditionally, Thailand is an agricultural country. Intensive farming in Northern Thailand is a reality, and this system has been seen as a problem to the environment mainly because of its amount of chemicals used. Farmers use more and more pesticide, herbicide, and fertilizer which through irrigation system into soil, rivers and even groundwater. Researchers Arsenio, Emilie, Helle, Jose, and Mst (2007) analyzed soil which contained mainly potassium. Changes in the biodiversity during especially the last 20 years are characterized by losses of species, crops, wild plants and animals.

The extensive shrimp farming, semi-intensive shrimp farming and intensive shrimp farming system are three popular shrimp farming methodologies in Southern Thailand where produced

the largest numbers of farmed shrimps. Researchers Teresia and Anna (2001) interviewed shrimp farmers in five provinces of the Southern Thailand. *“The main environmental impacts are due to chemical use, mangrove destruction, salinisation, eutrophication, sedimentation, extraction of ground water and spread of diseases and genes.”*

According to Greenpeace (2011), in intensive farming areas, *“groundwater wells used for drinking are heavily polluted with nitrates, endangering people’s health, especially for children. Dangerous pesticides applied in farms find their way into rivers and groundwater, and into foods sold in Thai markets. Direct poisoning with pesticides causes severe health effects on farmers, in 2003, for example 2406 cases of pesticide poisoning were reported in Thailand.”*

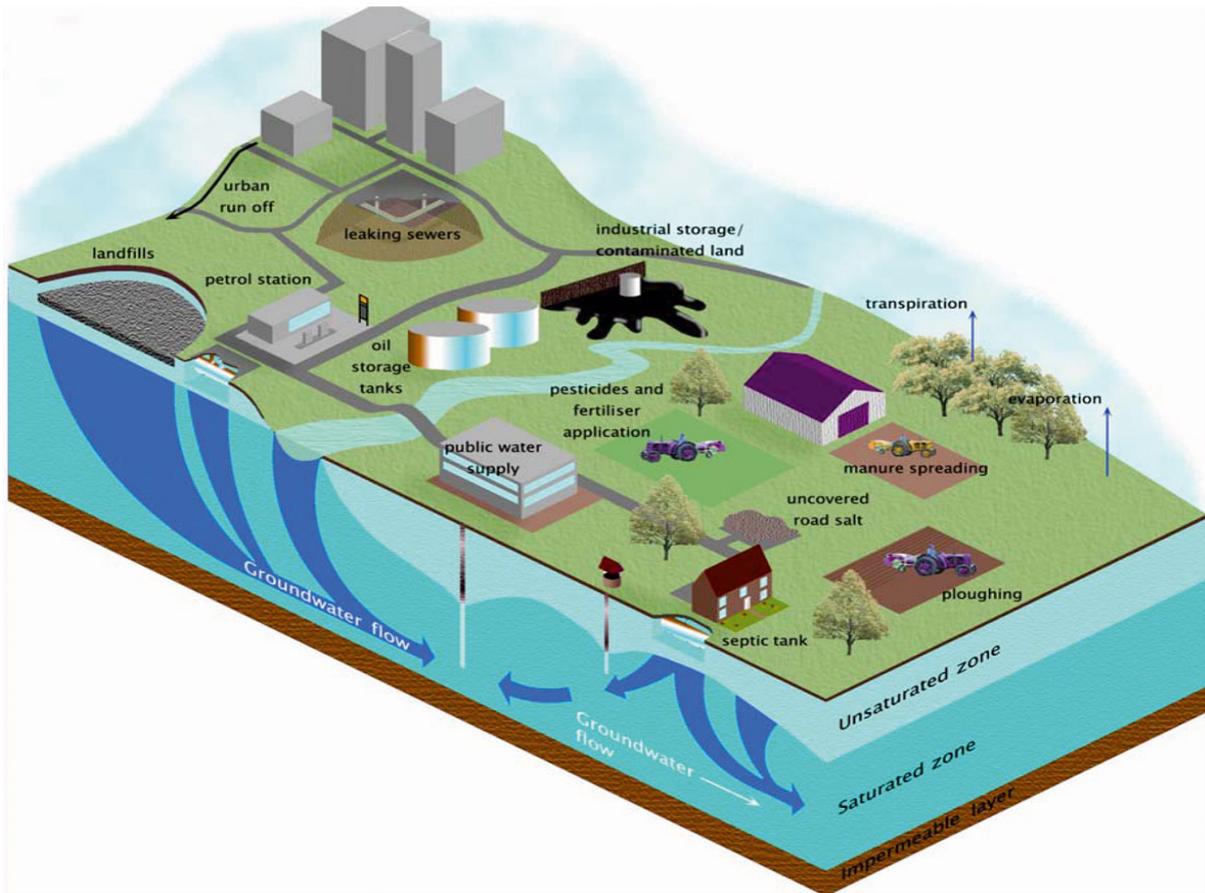
## **Water Pollution in Thailand**

Of course, we all need clean water to drink. But as the matter of fact, people in Thailand has witnessed water polluting from urban runoff, ship transport, untreated sewage, septic tank, animal dung, manure spreading, acid rain and eutrophication. Greenpeace Southeast Asia (2009) reported shocking statistics that *“92.68% of the total area in Thailand is at risk from water pollution. Within these risk areas, 6.87% is classified as high risk and could impact approximately 4,440,049 Thai citizens if corrective action is not taken immediately.”* This report ranked Bangkok, Samutprakarn, Samutsakorn, Chonburi and Rayong as high risk water pollution areas in Thailand. The Nation (2011) news agency conducted a survey which showed the biggest worries of Thai people as follows:

- *“91.5% - Water shortage stemming from water pollution and the effects of global warming*
- *90.3% - Polluted canals and rivers*
- *89.94 % - Dumping of garbage into waterways*
- *84.5% - The impact on health from water pollution*
- *84.1% - Toxic contamination in the food chain or environment”*

Thai Burapha University researcher Voravit and Chulalongkorn University researcher Piamsak (2003) pointed out serious water pollution in Thailand include: *“(1) Untreated municipal and industrial waste water are considered to be the most serious problems of Thailand due to limited waste water treatment facilities in the area. (2) Eutrophication is an emerging problem in the Gulf of Thailand. (3) Few problems have been documented from trace metals contamination in the Gulf of Thailand and public health threat from seafood contamination does not appear to be significant yet.”* From the figure listed below, water pollution comes from urban runoff, landfills, petrol station, leaking sewers, oil storage tanks, industrial storage, pesticides application, uncovered road salt, septic tank. Surface water will seep through the soil to ground water. If ground water is contaminated, pollute public water supply will be polluted as well.

**Figure 4: From Surface Water to Groundwater**



(Source: The Foundation for Water Research. (2011). *Groundwater*)

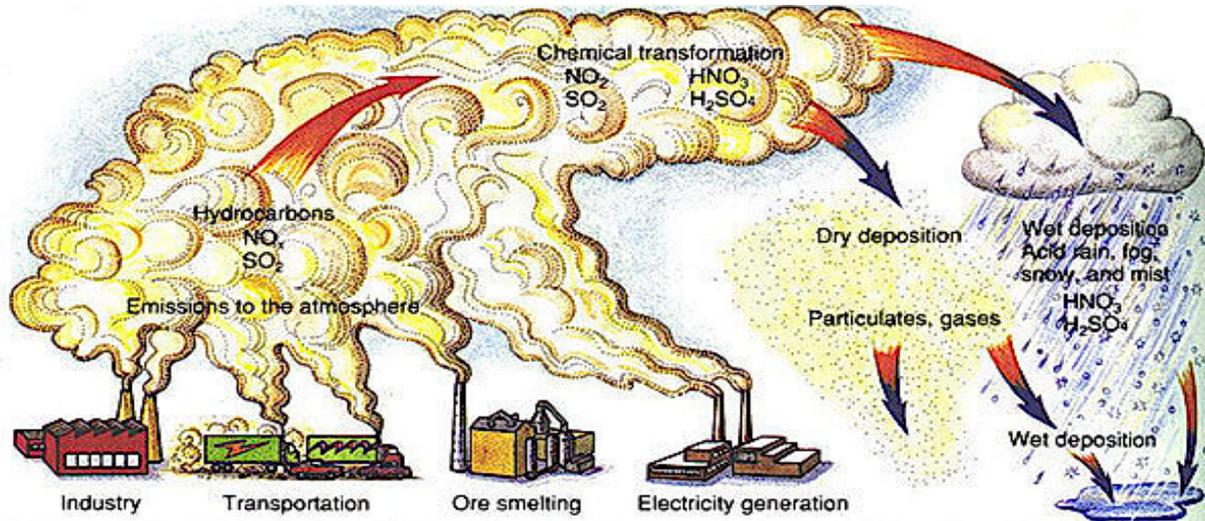
## **Air Pollution in Thailand**

Air pollution is a big problem in Thailand which makes many Thai people sick, harms the environment, and also affects the tourism industry. When you go to Sukumvit Road which is the business center of Bangkok City, there is always a long queue of cars waiting for traffic light turn to green. Then you will understand why air pollution is so severe. Since 2008, policemen in Thailand randomly set up road blocks to check the vehicles gas emissions on the spot. According to Thai Thammasat University researchers Nuntavarn and Nitaya (2011), Thailand now faces three kinds of air pollution“(1) vehicular emissions in cities; (2) biomass burning and transboundary haze in rural and border areas; and (3) industrial discharges in concentrated industrialized zones.”

Thai Suranaree University researchers Chuersuwan, Nimrat, Lekphet, and Kerdkumrai (2008) concurrently measured and identified major sources of PM 10 and PM 2.5 in Bangkok. Their findings showed that “seasonal difference of PM 10 and PM2.5 concentrations was distinct between dry and wet seasons. Major source of PM10 at the traffic site indicated that automobile emissions and biomass burning-related sources contributed approximately 33% of each. Major sources of PM2.5 at traffic site were automobile and biomass burning, contributing approximately 32% and 26%, respectively. Meat cooking also accounted for 31%

of PM<sub>2.5</sub> mass at a low impact site.” Take capital Bangkok City as an example, pollutions mainly from three resources: transportation, industry and electricity generation. They emit a lot hydrocarbons, NO<sub>2</sub>, and SO<sub>2</sub> to the atmosphere, then through complicated chemical transformation into acid rain.

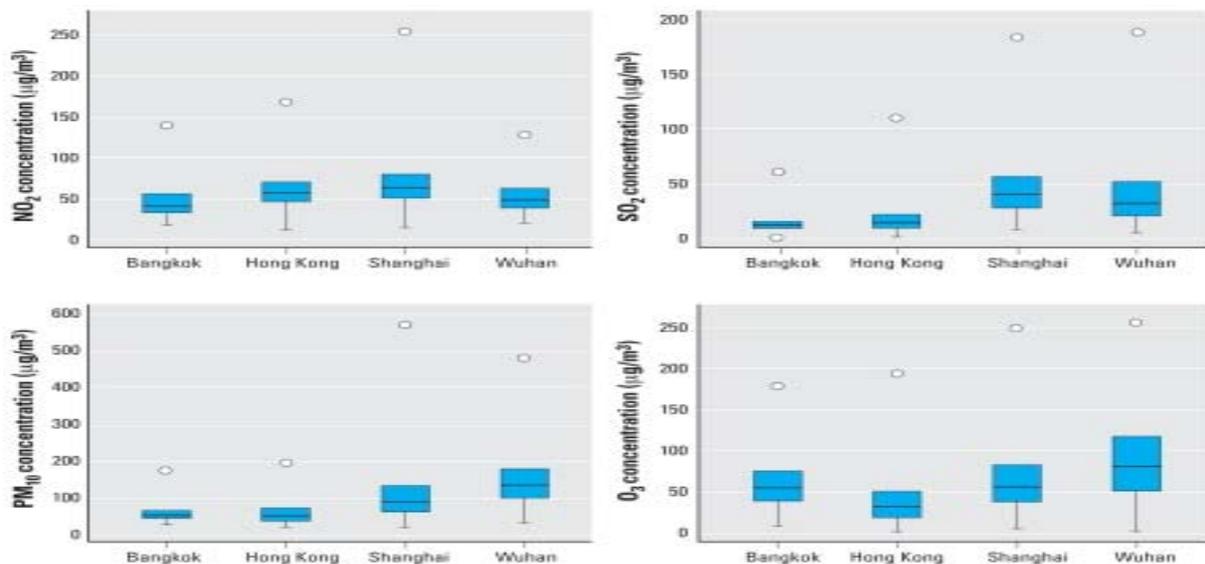
**Figure 5: Air Pollution Cycle**



(Source: Drexel University Website. (2011). *Air Pollution*)

Hong Kong University researcher Chit-Ming, Thai Thammasat University researcher Nuntavarn, Shanghai Fu Dan University researcher Haidong, and American Pennsylvania State University researcher Zhengmin (2008) assessed the four indicators: NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and O<sub>3</sub> in four international cities: Bangkok of Thailand, Hong Kong, Shanghai, and Wuhan of China. Overall, Bangkok showed the low concentrations of NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and O<sub>3</sub> comparing to other three cities.

**Figure 6: Box Plots of the Air Pollutants for Bangkok, Hong Kong, Shanghai, and Wuhan Cities**



(Source: Environ Health Perspect, 2008 July 9, DOI: 10.1289/ehp.11257)

Thai Chulalongkorn University researchers Jinsart, Tamura, Loetkamonwit, Thepanondh, Karita, and Yano (2002) measured airborne fine particles in Bangkok. Their findings showed that “almost all the PM10 values in the high-polluted area exceeded the Thailand National Ambient Air Quality Standards of 120 microg/m<sup>3</sup>,” while only 50 microg/m<sup>3</sup> is safe standard according to the World Health Organization Standards. The statistics from Thai Pollution Control Department (2008) indicated the air quality of ambient countries. If we compare Thailand with Japan, SO<sub>2</sub> 1hr was 0.78 in Thailand and just 0.26 in Japan. SO<sub>2</sub> 24hrs was 0.30 in Thailand and 0.11 in Japan nearly three times. CO 8hrs was 10.3 in Thailand and double to 22.8 in Japan. O<sub>3</sub> 1hr was 0.20 in Thailand higher than Japan 0.12.

**Figure 7: Comparison of Ambient Air Quality Standards**

Country	SO <sub>2</sub>			NO <sub>2</sub>			CO		O <sub>3</sub>		TSP		PM10		Pb		
	1 hr	24 hrs	Annual	1 hr	24 hrs	Annual	1 hr	8 hrs	1 hr	8 hrs	24 hrs	Annual	24 hrs	Annual	1 hr	24 hrs	Annual
USA	-	0.37	-	-	-	0.10	0.10	10.0	0.24	-	-	-	0.15	0.05	-	-	-
Japan	0.26	0.11	-	-	0.08	-	-	22.8	0.12	-	-	-	-	-	0.10	-	-
Netherlands	0.76	0.23	-	0.18	-	-	40.0	6.0	0.12	-	-	-	-	-	2.00	-	-
Australia	0.44	0.16	-	0.30	0.12	-	34.3	11.4	0.24	0.10	-	-	-	-	-	-	-
Mexico	-	-	-	0.40	-	-	-	15.0	-	-	-	-	-	-	-	-	-
Taiwan	0.78	0.26	-	-	0.10	-	22.9	-	-	-	-	-	-	-	-	-	-
Canada	0.82	0.27	-	0.40	0.20	-	15.0	6.0	0.10	-	-	-	-	-	-	-	-
Germany	0-	0.27	-	0.20	-	0.80	30.0	-	-	-	-	-	-	-	-	-	2.00
WHO	0.35	0.13	0.05	0.40	0.15	-	30.0	10.0	0.15	0.10	-	-	-	-	-	-	0.05
Thailand	0.78	0.30	0.04	0.32	-	-	34.2	10.3	0.20	-	0.33	0.10	0.12	0.05	-	1.50	-

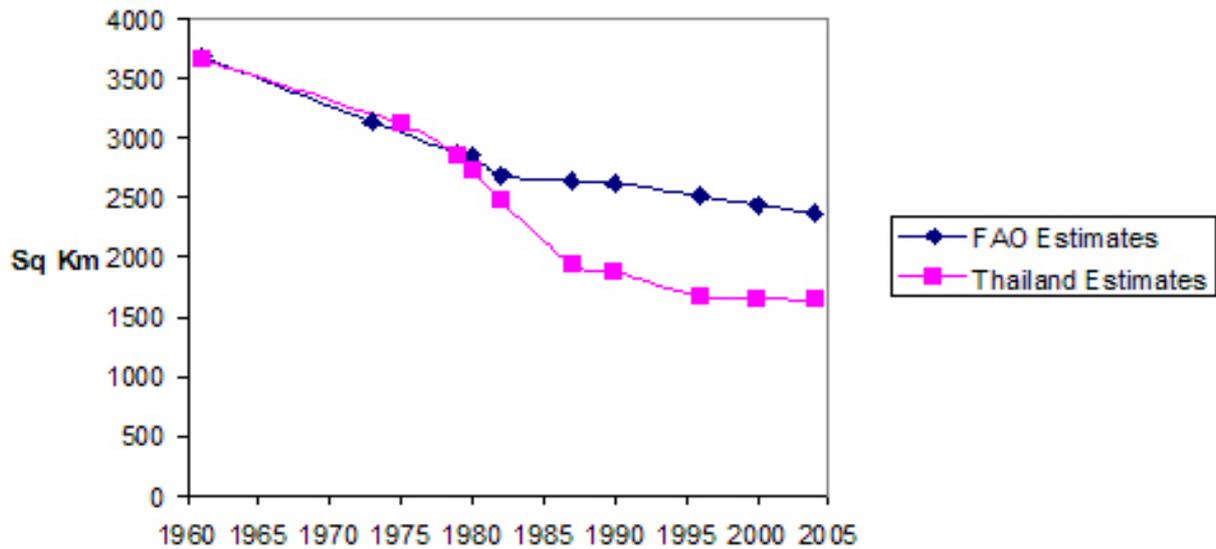
(Source: Pollution Control Department. (2008). *How do Thailand's Air Quality Standards Compare?* )

## Resource Depletion in Thailand

Since our natural resources are not inexhaustible, we should focus more on resource depletion problem such as: overfishing, deforestation, water crisis, land degradation, soil desertification, habitat destruction, and biodiversity loss. Researchers Trisophon and Punyawadee (2003) stressed that “drastic deforestation and resource depletion in Thailand has long been a recognized problem, drawing much attention and activities from both government and non-government organizations.”

Mangrove used to flourish in Thailand, but currently mangrove might be the next endangered species due to illegal logging. According to University of Wyoming researcher Edward (2007), extensive mangrove deforestation occurred in Thailand. In 1961, there were more than 3,500 square kilometer mangroves in Thailand. But in 2004, Food and Agriculture Organization (FAO) estimated around 2,500 square kilometer mangroves, while Thailand estimated less than 2,000 square kilometer mangroves. Annual average mangrove loss is illustrated clearly in the following figure. That's why it becomes a big dilemma for Thai government to replant or not replant mangroves.

**Figure 8: Mangrove Area (km<sup>2</sup>) in Thailand from 1961 to 2004**



(Source: Edward. (2007). *To Replant or not to Replant Natural Barriers? Perhaps that is the Wrong Question*)

## **Waste Generation in Thailand**

Waste generation is a serious problem especially electronic waste coming from discarded mobile phones, computers, televisions, refrigerators. Nowadays people frequently change their mobile phones not because of malfunction or technical problems but just because of showcase or fashion. In addition to electronic waste, there are medical waste, household waste, industrial waste, marine debris, river dumping, and landfill as well. Are they safe, or hazardous, or infectious, or even radioactive?

According to Thailand Environment Monitor (2003), *“Thailand currently produces nearly 22 million tons of waste from residences, industries, businesses, and hospitals. Management of this waste is a huge task that depends upon safe, hazardous, and infectious waste treatment and disposal systems need to be built to keep pace with the growth in waste generation.”* Thailand King Mongkut’s University researchers Oyeshola and Shabbir (2008) investigated that *“between 2002 and 2005, an average of 1.1 million tons of construction waste was generated per year in Thailand. This constitutes about 7.7% of the total amount of waste disposed in both landfills and open dumpsites annual during the same period.”*

## **Part II Green Lifestyles in Thailand**

As a developing country, obtaining sustainable development that reduces environmental pollution and keeps a continual economic growth at the same time remains a big challenge for Thai government. In order to raise public awareness of environmental protection in Thailand, Thai Government should spend more money on educating Thai people and providing classes in environmental literacy because public education is always the most effective tool to arm people with knowledge about the ways of how to protect environment. Just as researcher David (2008) stated that *“almost everything we do results in the production of carbon dioxide, but simple steps in our daily lives at home and elsewhere can make a huge difference.”*

## **Rethink**

In order to tackle the challenges of environmental degradation in Thailand, Thai people should rethink of the emergency of environmental protection and make green lifestyle choices start from rethinking, reducing, reusing, recycling to responsible (5R). It's time for us to take actions to reduce greenhouse gas emissions, reuse the durable household products, recycle the used materials, and finally enjoy a sustainable living environment.

## **Reduce**

As a responsible global citizen, Thai people ought to make a commitment to reduce the greenhouse gas emissions. Low carbon lifestyle is more natural and less pollution lifestyle. Low carbon food, low carbon cloth, low carbon household appliances, low carbon transportation, low carbon school, and low carbon office can reduce carbon footprint effectively and significantly. Also, action should be taken to reduce air and water pollution, reduce hazardous and radioactive waste, and reduce energy consumption.

## **Reuse**

As a responsible global citizen, Thai people need to develop the green habit of reusing products in order to lengthen the product life cycle. Buying durable household products and reusing them as much as possible before replacing them. Transform the unwanted materials into something useful that can be reused either for their original purpose or for a similar purpose. Before throwing away the unwanted items, thinking about if any relatives, friends, or charities can make use of them. Reusing an item not only saves money but also saves carbon emission compare to make a new product.

## **Recycle**

Is the used material recyclable? If the answer is yes, we need to recycle the used product in proper ways which can save money in purchasing and disposing costs as well. When a used item has reached the end of its life, we can create new products from the used goods. Using waste as material to remake a new product is another way. Recyclable rubbish includes waste paper, plastic, glass, metal, and fabric. Non-recyclable rubbish includes cigarette butts, brick, ceramics, dust, melons and other fruit shells.

## **Responsible**

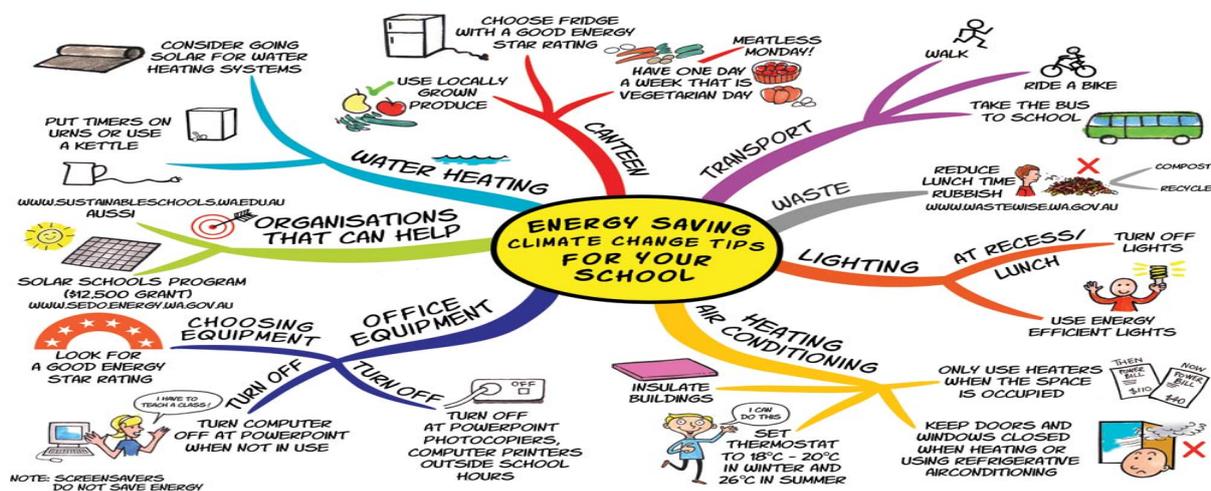
Although environmental degradation has attracted substantial attention from Thai people, widespread environmental problems still influence the lives of Thai people every year. As a responsible global citizen, Thai people must be aware that the environmental problems cannot be solved by one person but require the unity and cooperation of all Thai people. In order to achieve greener and cleaner environmental goal, it is time to combat the environmental problems and work cooperatively to protect the current ecological environment.

## **Part III Green Practices in Assumption University**

There are over 20,000 students in Assumption University which is the first international university in Thailand. Most students are from rich business families who prefer to drive their own car to the campus. If every student drives his/her own car, it will produce large quantity of air pollution definitely. Therefore, Assumption University always encourages students to use university coach or van this kind of public transportation tool to minimize the air pollution.

In addition to take the bus to school, there are many environmental friendly practices in school, such as: paperless office, no smoking campus, reduce lunch time rubbish, turn off lights before leaving, use energy efficient lights, keep doors and windows closed when using air condition, set air temperature at 26°C in summer, turn off computer when not in use, use locally grown produce, have one day a week that is vegetarian day, and consider going solar for water heating systems.

**Figure 9: Energy Saving Climate Change Tips for Your School**



(Source: Jane. (2010). *Creating Effective Behavior Change Programs*)

## Paperless Office in Assumption University

E-Enrollment	Online enrollment software makes registration process quicker and more manageable. Only 1-2 week for more than 20,000 student's registration.
E-Grading	Lecturers make a professional judgment and give an appropriate grade according to students' academic performances by using standardized e-grading system.
E-Request for Transcript	Students can ask for unofficial or official transcript from anywhere in the world at anytime, as long as internet access is available.
E-Library	As the university's main information center, digital library delivers comprehensive, intensive, and exclusive online resources to support teaching, learning and research.
Web-based Administration	The online HR management system is an innovative benefit program by streamlining office process, avoiding redundant paperwork and improving cost efficiencies.

## No Smoking Campus in Assumption University

In response to Thai government's tobacco ban law and minimize the air pollution, Assumption University has been implementing a smoking-free policy on campus. The nonsmoking signal is everywhere to remind faculty members and students of the cigarette ban policy. Smokers have to take smoking breaks right inside the campus because one person smoking causes much more people passive smoking. Violators no matter lecturers or students could be fined upwards of 2,000 Thai Baht.

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