
Pollution - A Global Issue That Needs To Be Addressed With Urgency By The Citizens Of The World

WHO air quality model affirms that 90% of the total populace live in places where air quality levels surpasses WHO's Ambient Air quality guidelines. This news is definitely not a surprise to many of us as it has become rather common to look up the sky and see smoke or haze blocking the sun. Before we dive into the topic pollution in details, let's take a look at the word pollution. What do we mean we say pollution? Pollution happens when we introduce foreign matters into a natural ecosystem and consequently these pollutants end up dirtying as well as rendering the environment unsafe for living beings. For example, contaminants are not only made up of the common pollutants that we know of such as ozone (O₃), sulphur dioxide, carbon monoxide, diesel exhaust and so on but are also made up of light, sound and temperature when they are brought into an environment artificially.

Now that we have analysed the word pollution, let's drill down to the type of pollutions that we are currently facing globally. Besides air pollution, we are also at risk from water pollution, noise pollution, soil pollution, radioactive pollution, light pollution and so on. According to the WHO, air pollution related death has hit an estimated 7 million per year with the highest recorded ambient air pollution levels in Eastern Mediterranean Region and South-East Asia.

As for water pollution, The Pacific Institute a global water think-tank group estimates that in developing countries that 90% of sewage and 70% of industrial waste is realised untreated into our river systems. As a result of this, 3.4 million people reportedly die every year of water-related diseases that are preventable.

Not all is doom and gloom as the world is realizing the importance of sustainability with more awareness being stressed, with the result that some part of Europe and Americas have seen decline in the concentration of ambient air pollutions. As a country that is in South-East Malaysia, we Malaysians should be even more concerned on how to overcome and positively impact the pollution problem that has seen a steady rise over the years in our region.

Firstly let's take a look at air pollution in Malaysia. In Malaysia air pollution is usually measured using the air pollution index (API) that is calculated from major air pollutants which is sulphur dioxide, nitrogen dioxide, carbon monoxide, particulate matter of less than 10 microns in size and ozone (Department of Environment). The table below (Figure 2) gives us the index scale for the API. Our API index should always be in the blue zone which is the good zone while anything beyond 301 which is the red zone is hazardous for us.

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Open burning in Malaysia has always been a bone of contention for the parties involved especially those who feel that clearing a land by razing it with fire not only reduces the cost but is less time consuming as well. Alas open burning has been known to degrade the quality of air as well as contribute to the loss of organic materials important for enhancement of soil. When open burnings are done especially during the dry months the particulates and heavy smoke that are emitted goes directly into the air and causes the haze phenomena. The situation is worsened by the occurrence of El Nino which plagues the South-East Asia region every few years causing a dry spell, with rain volume going down and a spike in temperature that has also resulted in forest fires which compounds the problem even more. In the year 2015, the DOE managed to pinpoint 2,335 hotspots through satellite while ground surveillance managed to detect a total of 3,459 open burning occurrence.

In addition to open burning, we also face a major air pollution issue caused by mobile sources which can be contributed to urbanization, the lack of public transport in Malaysia and also poor road conditions. Due to Malaysia's vision to be a developed nation by 2020, urbanization has been a necessity which consequently has caused an increase in vehicles used in our country. According to the Malaysian Automotive Association (MAA), as of 30 June 2017, the number of vehicles that are on the roads is 28,181,203 units which translate into 0.88 vehicles per person in Malaysia. As a result, not only CO₂ emission has increased but also the emission of other gasses such as carbon monoxide, nitrogen oxide, volatile organic compounds, ozone and so on. As the lack of public transport has made it difficult for an average citizen to travel to places without their own car, it is time for the government to step up and find a solution for this dilemma.

The consequences of all these air pollutants contaminating the air are a significant rise in health problems, breathing problems and also skin diseases among the global citizens. According to WHO, air pollution accounts for 25% of deaths and diseases from lung cancer, 17% of death and disease from acute lower respiratory infection, 16% of death from stroke, 15% of death and disease from ischaemic heart disease and 8% of deaths and disease from chronic obstructive pulmonary disease (World Health Organization). We Malaysians must work hand in hand with the government to address this issue.

One of the very first things that we Malaysians can do is educate the public especially those in the rural areas on the impacts of open burning. More programs on the negative impact of open burning can be conducted by not only the government but also NGOs and also academics that are experts in these areas. Moreover alternate ways that are less costly should be implemented and the proper education of that to be conducted by the relevant parties. The DOE of Malaysia has already introduced some ways that are better alternatives compared to open burning such the decomposition of organic waste material such as food to be buried and decomposed which in return will fertilize the land. Secondly the waste from agriculture, branches and fallen trees in

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farming could be decomposed and used as fertilizers as well. While the ways were introduced, the how to's and where to's are not so clear with not much emphasis given on them. In the US, organic wastes are collected by organic collection services run as a social enterprise that uses commercial tactics to produce community and environmental improvements. A few examples of such enterprises are EverGreen Zero Waste, FoodScrap360, Team Green Recycling and so many more. These initiatives could reduce not only open burning but also the area of landfills needed for trash. The Penang government has over the years introduced more and more green initiative with the recent one being segregation of waste materials into recyclable and non-recyclable items. This initiative will in the term long reduce not just open burning, air pollution but also land pollution and also water pollution as less trash are thrown into water. According Penang Mayor Datuk Maimunah Mohd Sharif, the Penang Island City Council has hit a 28.4 percentile of recycling rate for the year 2017. These initiatives especially the plastic ban initiative should be spread to all the countries in Malaysia with proper education given by the relevant parties. The government, people and NGOs should all work together to reduce this issue in Malaysia as a positive impact can only be seen when cooperation between all parties are seen.

Pursuing this further, air pollution caused by vehicles can also be reduced in a number of ways. The government has already initiated 'Park and Ride' concept in a number of cities. In Penang it is known as Bridge Express Shuttle Transit (BEST) system whereby those who are working in Penang Island can park their cars in a certain place such as Sunway Carnival Mall and take the bus to Bayan Lepas Industrial Zone. The Penang Government collaborated with Rapid Penang to provide this service which has impacted positively in reducing the number of vehicles used. This has indirectly reduced the emission of hazardous fumes from vehicles. Furthermore, the government has proposed an LRT line known as the Bayan Lepas Line which will pass through must-go-points at KOMTAR, Bayan Lepas FIZ and Penang International Airport which will also connect several residential townships and employment hubs on the island. In addition another LRT line which will connect the island and mainland has also been proposed (Penang Transport Master Plan). We as Malaysian can further improve on these initiatives by car pooling as well. Eventhough the government is introducing more and more green initiatives, th effect will can only be improved if we as the citizens are willing to do our bit as well. Car pooling to work or even school can be done by parents whose children go to the same school. Usage of the school bus and also buses to work is also another way we can further reduce vehicle usage. Rather than 1 person 1 vehicle, it will be at least 30 persons using 1 transport to get to their destination. Multiply that with 1000 and the impact will be huge. All these initiatives will reduce CO2 emission in the long run.

Another major pollution issue that has caused numerous problems to both human kind and also animals is the contamination of water. Millions of tons of untreated water both from industries and agriculture are released into the world's water on a daily basis. The most damaging water contaminants caused by human activities are microbial pathogens, nutrients, oxygen-consuming

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materials, heavy metals and organic matter as well as suspended sediments. Eutrophication which is the consequence of nitrogen and phosphorus contaminating the water and making it nutrient dense affects the water quality as well. This in return causes the overgrowth of vascular plants and algal blooms which reduces the oxygen level in the water and kills off marine life. Let's take a look at the contaminants released by the agriculture sector and the effects it has in our water system.

Agriculture is a major economic productivity for Malaysia though the effect it is having on our waters due to a lack of control in their usage is quite a worrisome issue. The major pollutants created by agriculture come from pesticides, animal manure, fertilizers, ploughing activities as well as irrigations. Pesticides that are sprayed on the crops usually causes runoff that leads to the contamination of surface water. Some pesticides are found to have even contaminated marine life thousands of miles away as the contaminant is carried by the wind, which eventually ends up landing in distant water. In addition, animal manure is also another unavoidable pollution that affects the water system. Most animal corrals are washed with water which then flows out of the corrals into the irrigation system or even absorbed by the ground leading to the degradation of surface water and ground water quality as most faeces and urine contain pathogens, metals, antibiotics and other chemicals that are harmful to humans and marine life.

The second major pollution in our water system seems to be plastic pollution of our seas. As reported by Worldwatch Institute, 299 million tons of plastics were manufactured in 2013 but the recovery and recycling were not adequate enough which caused plastics to end up in oceans. The very nature of plastic which is durable and strong has become the bane of our existence as this is the very reason why plastics do not decompose easily and tends to float on our oceans for a long period of time. Most of us have seen reports of marine life ingesting or entangled in plastics and dying as a result. According to the University of Exeter, all seven species of marine turtles are at risk from plastic ingestion or entanglement, with even the hatchlings being affected as they get entangled in plastics littering the shorelines. If the current trend continues, most of our oceans will soon be a floating plastic landfill.

Apart from plastic pollution, we are facing an additional issue with the rise of water temperature. This is happening due to the heating and releasing of said cooling water into the water system by industries or power generation facilities. A higher water temperature in turn results in less oxygen content in the water which disrupts the biological functions of marine life as well. This indirectly affects us as well, since the reduction in marine life means less food for consumption and with the population of the world rising over the years, it will eventually cause food shortage globally.

Around the world, waterborne diseases have become the leading killer with more dying from poor water quality than any other reason. Waterborne diseases are classified into four major

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classes known as waterborne (fecal – oral), waterwashed, water-based and water related insect vector. Many of these diseases spread due to consumption and usage of contaminated water on a daily basis. Examples of waterborne disease are cholera, typhoid, rotaviruses and so on.

Rather than looking at the problem, solutions and ways to reduce these pressing issues should be our main concern. Pollution prevention”, or “source control of pollutants”, is the banning, avoidance, reduction, or elimination of a contamination at the source. An effective way to prevent water pollution is to maximize water usage so that wastewater production is reduced. We as Malaysians who rarely suffer from lack of water have always taken for granted our abundance supply of water. As a way to impact positively on prevention, we can fix all the faulty, leaky pipes and taps which in return reduce wastewater. Another way that we can contribute is to reuse water as much as we can. For example, using the water used for washing vegetables and rice to water the plants or we could also set a water usage limit in our household with incentive given to the members of the household for achieving the target. As for those in the agricultures sector, a proper irrigation system and tailwater return systems could be a good solution that can be implemented. The irrigation system can prevent runoff of pesticides or animal manure directly into the water system and instead collect the water for reuse in the farm using the tailwater return systems. Besides that, organic or biological agriculture such as using crop rotation, mulching, composting, cover cropping, and integrated pest management should be considered and implemented and this cannot be done without either pressure, incentive or education from the government on these methods and benefits. The government and NGOs should educate the public more on the impact of water conservation as a lack of awareness among Malaysian on the global pollution level has not been addressed. More schools and colleges should make environmental studies a necessary part of the education system which should be enforced by the government as well.

As for solution on plastic pollution, the only way we can actually reverse this problem is to do beach cleanups. It does not have to be a government initiative rather schools, colleges or even corporations could organize and rally people for beach cleanups. To date the largest and most impactful beach cleanup was initiated by a single man named Afroz Shah who together with volunteers who joined later cleaned up Versova Beach and within two years ensured that marine life as well as humans could enjoy the beach again. Another way that we can impact this is by reducing plastic usage. In certain states in Malaysia, plastic usages are banned in shopping malls and restaurants. This has encouraged people to reuse or even bring their own bags when they are shopping. More could be done by Malaysians such as bringing in containers when taking out food from hawker stalls and reusing them, not throwing rubbish into the drainage system and so on. The government as well should reinforce stricter laws on law breakers rather than treating it as a minor issue.

There has been no lack of technologies when it comes to conservation of environment and this

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has proven true for power plants and industries who can utilize various technologies to prevent the release of heated cooling water into the water system. Some power plants in US have successfully used dry and hybrid cooling technologies without any affect to their production. Other alternatives include the usage of degraded water sources coupled with recycling water within the plant as well as increasing the plants thermal conversion efficiency.

In conclusion, it is undeniable that pollution has become a global issue that needs to be addressed with urgency by the citizens of the world. The responsibility does not lie with only the government or even corporations but it should be shouldered by each and every one of us. The two major pollution which is air and water on which our very lives depends on should be given more importance with stress made on reduction, reusing and recycling of hazardous materials. Corporations should be more social conscious and take every effort to reduce pollution as well. Lastly the government should educate the public on new technologies as well as better ways to manage their waste from a young age.

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