

# Plastics Pollution in Asia

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# Plastics the Ubiquitous Material

## Where did it come from?



We are all aware that plastic is a polymeric material — a material whose molecules are very large, often resembling long chains made up of a seemingly endless series of interconnected links.

**Natural polymers such as rubber and silk exist in abundance, but nature's "plastics" have not been implicated in environmental pollution. Because they do not persist in the environment.**



# When did Plastic Pollution become so ubiquitous?



- Synthetic plastics we know are largely non bio-degradable and tend to persist in natural environments.
- Many lightweight, single-use plastic products and packaging materials are not deposited in containers for subsequent removal to landfills, recycling centres, or incinerators.
- **These single use plastics account for approximately 50% of all plastics produced**



# When did Plastic Pollution become so ubiquitous?



- Plastics are improperly disposed of at or near the location where they end their usefulness to the consumer.
- Dropped on the ground, thrown out of a car window, heaped onto an already full rubbish bin, or inadvertently carried off by a gust of wind
- They immediately begin to pollute the environment.
- Landscapes littered with plastic packaging have become a common sight in many parts of the world.

# When did Plastic Pollution become so ubiquitous?



- **World plastic production grew from some 1.5 million tons in 1950 to an estimated 275 million tons in 2010**
- **Some 4 million to 12 million tons is discarded into the oceans annually by countries with ocean coastlines. ( Source: Plastics Europe)**





**Why Are we suddenly talking about Plastic Pollution, is it that serious?**

**When did it become such a problem and when did we start talking about it? Some Facts**



## PLASTICS CONSUMPTION IN INDIA

S. No.	Year	Consumption (Tones)
1.	1996	61,000
2.	2000	3,00,000
3.	2001	4,00,000
4.	2007	8,500,000

*Source: Central Pollution Control Board*

Consumption has increased nearly 140 fold between 1996 and 2007!

Calculate ten years ahead how much it would be?

**Double the 2007 figure.**



## Plastics in Asia

# Plastics in Asia



## Plastics in China

**According to Bloomberg, since January 1<sup>st</sup> 2018, when China stopped accepting the rich world's plastic waste, it got tons of criticism to worsening the already deep crisis of ocean plastics. But China isn't the only culprit here. This is a crisis made ----- and growing worse --- throughout developing Asia.**





**The plastic production in the world in 1951 was 2.3 million tons**

**Globally Nearly half of all Plastic Ever Manufactured was from the year 2000, about 443 Million Tons in 2015**

**Half of the world's plastic is made in Asia – almost one third of it is produced in China**

**The rest of Asia is about 21% of that which includes India and other countries.**

**Plastic pollution: 8 countries in Asia are responsible for 63% of total waste flowing into oceans**



# Plastics in Asia



- Roughly 8 million tons of plastic is dumped into the world's oceans every year
- According to a new study, the majority of this waste comes from just five countries: China, Indonesia, the Philippines, Thailand and Vietnam. (Source:Eco Watch)



# Plastics in Asia



It's projected that by 2025, plastic consumption in Asia will increase by an astonishing 80 percent to surpass 200 million tons.

It appears that these five countries, China, Indonesia, the Philippines, Thailand and Vietnam, are responsible for up to 60 percent of the marine plastic entering our oceans, according to *Stemming the Tide*, a study released last month by the Ocean Conservancy and McKinsey Center for Business and Environment.

Unless steps are taken to manage this waste properly, **in ten short years the ocean could contain one ton of plastic for every three tons of fish, "an unthinkable outcome"**, the study says.





**Improving waste management in these five countries, China, Indonesia, the Philippines, Thailand and Vietnam can reduce global ocean plastic leakage by 45% over the next ten years by 2025 if a series of concrete steps are taken.**

**How can we help in not only these 5 countries but in Asia and the Pacific as a whole?**





# What Can we Do?

You may recall at the beginning of this presentation in diagnosing the problem we had seen that “many lightweight, single-use plastic products and packaging materials, account for approximately 50 percent of all plastics produced”. **On the left is an example. It is a photo of my lunch at Don Mueng Airport.** Can you see the amount of plastic involved for one small meal. **There is big a role for government and companies to start immediately reducing such single use plastic.**



## What We Can Do?

**Make Garbage Separation a major activity and ingrain this into every person in society. This is key to control waste at source and it is this lack of control that is taking our plastic waste to the oceans.**

**Controlling production is the role of governments. Reducing use and controlling the waste is the responsibility of citizens!**

**This requires massive education and awareness campaigns combined with active cleaning up activities.**





## What We Can Do?

### RECYCLING ALONE WILL NOT HELP

Not long ago, we existed in a world without throwaway plastic, and we can thrive that way again.

The world's largest corporations – with all their profits and innovation labs – are well positioned to help move us beyond single-use plastics.

All over the world people are already innovating toward solutions that focus on reusing and reducing plastics. It's time to accelerate this process and move beyond half measures and baby steps.

Corporations are safe when they can tell us to simply recycle away their pollution.

Anne Leonard in *The Guardian*, 9<sup>th</sup> June, 2018



# What Can We as Engineers do together with UNESCO Science?

- ◆ Since banning or recycling plastics alone will not work, Engineers have a special role in generating technologies and dealing with alternatives to plastics and re-use of plastics.
- ◆ Integrate and draw up new curriculum to support governments in the region to reduce plastic production and recycle plastic.
- ◆ Training of Teachers for Curriculum Integration on dealing with plastic pollution.
- ◆ Revisit Engineering and Technology curriculum with a new focus on Circular Economy and Technology.





## What Can We do together with UNESCO Science?

- ◆ Work on new curriculum on dealing with plastics at all levels from schools to higher education institutions.
- ◆ Training of Science Teachers for Curriculum Integration and Education on plastic pollution and dealing with it.
- ◆ Train young people to educate the elders on avoiding plastics by creating science activities and education for young people in schools.
- ◆ Have regular clean up campaigns and using it for public education.



## What Can We as Engineers do together with UNESCO Science?

**Chemical Engineers and Environmental Engineers have a special role in promoting the Circular Economy.**

Professor Roland Clift, of the Surrey University, Centre for Environment and Sustainability says, “There is a growing interest in the ‘circular economy’ as a way to improve resource efficiency.

The circular economy is a topical example of why the chemical engineer's way of thinking has so much to offer.....it is clear to anyone with a chemical engineering background that the key to resource efficiency is to get best value from materials and products in use — the stock — and reduce their flow through the economy.

The most important change is therefore to increase the service life of goods in use — what we chemical engineers term the ‘residence time’.”





**Thank You**