

VOLUME 2 • JULY 2021

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**A NOTABLE
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PLASMA TECHNOLOGIES FOR MUNICIPAL SOLID WASTE TREATMENT

Dr. Krishna Gopal
Rajdhani College, University of Delhi

img source: indianexpress.com



In Physics and chemistry, plasma is an ionized gas containing electrons, ions, and neutral atoms characterized by collective behavior. In general, plasmas can be generated by applying an electric field to a neutral gas when the applied field exceeds a certain threshold (breakdown strength) a gas discharge and thus plasma is formed. Thermal and Non-thermal plasma-based pollution control technology can assist in reducing the health and economic impacts in the future. Environmental pollution affects human health and the economy, where approximately 0.06–0.09% of the population experiences premature death caused by air pollution [1], and 2.5 to 3 times these numbers are admitted to hospitals. Economic development, globalization, and rising living standards have increased the quantity and complexity of generated waste, while industrial diversification and the provision of expanded healthcare facilities have added substantial quantities of industrial hazardous waste and biomedical waste into the waste stream that have severe environmental and

human health consequences.

Air pollution can be controlled by using non-thermal plasmas, solid and liquid wastes treatment by thermal plasmas, and drinking and wastewater treatments by thermal and non-thermal plasma methods [2-3]. The majority of plasmas operate under atmospheric gas pressure and higher electron temperature. The present article describes the plasma arc technology for solid waste treatment and compares it with conventional methods of treatment.

Plasma-arc technology was developed during the late 1800s to provide extremely high temperatures and is employed in the metallurgy industry. In the early 1900s, plasma heaters were used in the chemical industries to manufacture acetylene from natural gas. Plasma-arc heaters have also been used in the NASA Space program in the early 1960s for simulating and recreating the extremely high heat of re-entry into the earth's dense atmosphere encountered by spacecraft from orbit. Large-scale industrial plants were built

and commissioned for the development of plasma arc technology during the 1980s by various companies like Pyrolysis Systems Inc (Canada), Siemens (Germany), Plasma Energy Applied Technology Inc (USA), Plasmapole (France), etc.

In general, an electrical arc produces, when relatively high voltage or high current electricity is passed between two electrodes that are spaced apart. Inert gas under pressure is passed through the arc into a sealed container of waste material that creates very high temperatures around 14,000 °C in the arc column. Most of the wastes dissociate into basic elemental components in a gaseous form, and complex molecules are separated into individual atoms at very high temperatures. Plasma arc (from electrical input) has been in

use for many years as part of waste disposal/destruction. When solid waste exposes to very high temperatures around 3000-4000 oC, the organic components are broken down into simpler atoms/molecules and inorganics are melted into a glassy slag.

When this operates in an oxygen-containing atmosphere or air, the organic components burn to produce CO₂ and water. In the absence of oxygen, the process is termed 'plasma gasification' and it produces a combustible gas, made up mainly of carbon monoxide (CO) and hydrogen which can be cooled and treated for use in other equipment. Precursors to dioxins/furans will be destroyed at the high operating temperatures; though care is necessary to avoid them reforming as the gas



stream is cooled. In present plasma gasification plants, the temperature level has been reduced to optimize power use that gives favorable conditions for volume reduction of ash (as an inert glassy slag for beneficial use) and destruction of toxic components in flue gases. Incineration is the conventional method to burn the waste material in the presence of oxygen. Incinerators have significant air emission control problems. It has been reported that the incinerator works at low temperatures (400–500°C) in the Delhi waste treatment plant. There remains a possibility of the survival of the pathogen if the incineration is incomplete or done at a low temperature. An ample Airflow is a key requirement to enhance the combustion process in the incinerators. The demand for excess airflow limits the achievable

temperature. Due to insufficient temperature generated in the process chamber, incinerators produce extremely toxic products like furans and dioxins. This can cause air pollution or the toxic pollutants can remain in the bottom ash, eventually finding their way into landfills. Whereas, in the case of plasma waste treatment, very high temperatures are obtained and complete dissociation of waste takes place. Thus, no residue is formed which is to be again treated as waste.

The plasma gasification process uses very high-temperature plasma to disrupt the waste. Carbon-based waste is almost converted to fuel gas, therefore, plasma gasification is considered as closest technology available that produces no hazardous waste. All the tars, char, and dioxins are broken down because of

the temperatures and drastic conditions involved in the waste treatment process. The gaseous output from the reactor is cleaner and there is no ash at the bottom of the reactor, while there are no by-products that end up in landfills provided that there are available markets for the produced slag. The use of plasma gasification processes reduces methane emissions produced from the disposal to landfill sites.

Plasma technologies have major advantages in comparison to conventional technologies: It creates less atmospheric pollution compared to combustion/incineration technology. Since the system works in absence of oxygen, oxides of nitrogen and sulphur are not emitted during normal operations. Toxic materials become encapsulated and are therefore much safer to handle than the toxic ash left by the combustion process. Since the plasma arc would instantly convert organic materials into synthetic gas, often called 'Syngas', and melt inorganic materials, which when cooled become rock-like and can be sold as construction materials. It disposes of waste materials very quickly. The present technology can be utilized to run large-scale waste treatment plants with less running cost.

The major disadvantages of the plasma gasification technique can be described as The installation cost of the solid waste treatment plant is quite high as its average cost for setting a plasma gasification plant is about Rs. 1-1.2 million. Volatile metals obtained as a by-product after treatment can lead to vaporization and it might mix in the main air stream. The materials of construction of the unit and the air management system will have to be designed to handle these materials if they are introduced into the unit.

The electrodes used for plasma arc are consumed gradually during the waste melting cycle. They should be replaced regularly.

Plasma-based arc technologies are being used widely for solid waste treatment that emits non-hazardous by-products in the form of syngas and rock type material. Since the installed plant has high net energy input (i.e. high operating cost) and high capital costs, it seems uneconomic for more general wastes. Recently, modified designs of the plasma-based plant have been developed with optimized parameters to take advantage of the perceived environmental credentials, compact footprint, and potential for high conversion efficiency when the 'syngas' is used with downstream power generation equipment. Now, the by-products from the solid waste treatment plant are being offered in the form of electrical output and claimed low capital and operating costs of the plant.

[1] J. S. Chang, *J. Electrostatic.* 57 273–19(2003).

[2] K. Urashima and J. S. Chang, *IEEE Trans. Dielectr. Electr. Insul.* 7 602–14(2001).

[3] J. S. Chang, *Plasma Sources Sci. Technol.* 17, 045004 (2008).



img source: tconserve-energy-future.com



WASTE MANAGEMENT

-Hana Dhaka

As per Wikipedia, waste management comprises the actions essential to manage waste from its commencement to final disposal. This includes waste assembly, transportation, treatment and disposal, along with monitoring and regulation of the waste management process and waste-related laws, technologies and economic mechanisms.

Despite imposition of several laws, waste management is one of the major stumbling blocks that we face as a nation. India airs numerous environmental challenges linked with waste generation and insufficient waste collection, treatment and disposal. The prevalent system in India isn't modernized and equipped enough to deal with the enormous quantities of waste generation, especially in cities. This further amplifies the impact on public health and the environment.

Throughout the years, numerous rules and laws, namely- 'The Environmental Protection Act'; which confers powers to the Central Government to regulate all forms of waste along with embodiment of 'Polluter Pays Principal', the 'Hazardous Wastes Rules, 2008', 'The Plastic Waste Rules, 2011', 'BioMedical Waste Rules, 1998', 'The E- Waste Rules, 2011', have been implemented. More recently, 'SWMR, 2016' has been of prime attention. National Green Tribunal has also issued several notices. MoEF in 2017 has updated draft rules wrt to MSW (Management and Handling) Rules 2000. However, the prominent challenges with these policies is their implementation. Waste degradation is broadly limited to documents and has remained fairly unchanged with the growing desideratum.

ECO TIP!

FIX IT, DON'T THROW

Repairing something is more eco friendly than simply throwing things away.



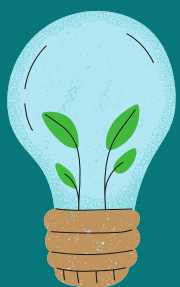
The inflow of money is directed towards waste collection plus transportation instead of segregation, treatment, and disposal. The municipalities stick to waste collection and its dumping in under functional dispensation sites or landfills. Waste that is wet, dry and toxic is clustered together and dumped at a landfill. Once wet waste starts rotting and decomposing, the formation of methane gas, flammable and greenhouse gas begins. Additionally, enforcement of bye-laws remains a challenge.

According to the Central Pollution Control Board report of 2015-2016 which has the last collated figures on the implementation of Solid Wastes Management Rules, 2016, over 1.3 lakh tonnes of solid waste is generated per day in India. Of the total waste generated, while over one lakh tonnes per day (1,11,027.55 TPD) is collected, only a fraction – 25,572.25 TPD is treated and 47,415.62 TPD is landfilled. India spend on May 12, 2017 reported that more than 90% of India does not have a proper waste disposal system.

To add to the government's obsolete implementation, there is high degree of unawareness amongst people, be it rural areas or urban complexes. It's disheartening to see low visibility and high pollution levels even in hilly capitals like Nainital and Shimla. Nescience has led to greater incidence of stubble burning and incineration, leading to forest fires and increased PM 2.5 levels.

Ideally, metropolitan cities should have the most robust system of waste disposal, owing to better road connectivity, technology, and infrastructure. Yet the roads are littered with waste and despite most people being literate, failure to understand the basic concept of cleanliness and waste segregation is dispiriting.

Delhi, the national capital has witnessed lack of accountability with respect to enforcement of Solid Waste Management Rules (SWMR) of 2016, since no law has been implemented in two years. SWMR states that waste must be segregated at source and if not, then defaulters must be penalised, but as per experts, not even a single case was registered.



ECO TIP!
USE ECO FRIENDLY CLEENING PRODUCTS.

The three landfill sites, Ghazipur, Bhalswa and Okhla, are not designed as per provisions mentioned in the SWMR. Wretchedly, these landfill sites surpassed their capacity back in 2008 and have contaminated groundwater.

The state of affairs is grotesque, but with the precise policies and coordinated implementation, our country can be protected from further damage. The idea is to think global, act local. It is noteworthy to mention and learn from some cities in India that are doing a fantastic job in terms of waste segregation. What intrigued me during my stay in Goa was the segregation of waste at source. Panjim's municipality segregates dry waste into 30 categories. According to Swachh Survekshan 2017, Indore is listed as the cleanest city in India. An article by NDTV states how Sikkim's school waste management initiatives have influenced individuals to practice segregation and recycling. Moreover, Kolkata has been recognized among the top 10 cities across the globe for its innovative programmes with regard to solid waste management (SWM).

In conclusion, the idea is to tackle problem at the 'source', in addition to hybrid solutions. Rules should be levied by the state governments to begin basic waste segregation at home (biodegradable, non-biodegradable, wet and dry waste). Heavy fines should be charged from urban complexes that don't abide by these rules.

Further, minute segregation should be done under municipal corporations. A report by IIT Kanpur (2006) found the potential of recovering at least 15 % of waste generated every day in the country which could provide employment opportunities to about 500,000 rag-pickers.

Policies and laws that emphasize on investment in technology, bio-composting (conversion of waste to energy) should be prioritized. The treatment plants should further run-on the energy generated from segregated waste. Landfill taxes should also be imposed.

Education laws that focus on practicality may enhance the cognizance. SWM and Sustainability should be a compulsory subject, wherein students take up projects analysing the impact of waste on the environment and develop methods to make waste segregation simpler instead of barely reading books on environmental conservation.

The government has to realize the necessity of balance between economic growth and sustainability. Thus, the focus should be on making waste segregation as one of its priorities, instead of merely drawing a veil over the garbage dump in the name of 'waste policies'.

INTERNATIONAL DAY FOR THE CONSERVATION OF THE MANGROVE ECOSYSTEM

Celebrated each year on 26th July from 2015 after being adopted by the general conference of UNESCO, International Day for the Conservation of the Mangrove Ecosystem aims to raise awareness among people about the importance of the mangrove ecosystem and our need to conserve it. The mangrove forests have rich biodiversity and are habitats for a significant number of species.

IS COVID-19 ALSO UNHEALTHY FOR OUR ENVIRONMENT?

– Dr. Pooja Tomar



Safe disposal of solid wastes has been a stringing problem in most developed and developing countries. An increase in population, urbanization, economy, and living standards have resulted in the rise of the amount of municipal solid waste over time. While waste disposal is already a subject of major concern, the current pandemic situation has added up to it because of a drastic increase in healthcare-generated waste worldwide.

The current pandemic, novel COVID-19, has had an unprecedented impact on the social, economic, as well as on environmental aspects. Whilst socio-economic aspects suffered, positive mending effects were seen on the environment. Various countries reported low levels of pollutants and pollution with improved Air Quality Index (AQI) as a result of curfews, lockdowns, and moratorium on industrial activities. A lower intervention of human activity has rendered to have a healing effect on the environment.

However, there also have been various negative consequences of COVID-19. There has been a significant rise in medical and domestic waste since the outbreak of Covid-19. To protect oneself from the virus, people are using face masks, hand gloves, and PPE kits resulting in increased healthcare waste which can persist for a long time and release toxic elements to the environment. It's no doubt that we need these safety measures, but safe disposal after use is equally important.

In addition, to treat the patients, a huge amount of infectious and biomedical waste is being generated from hospitals which is harmful to the environment. There has also been an increase in domestic and municipal waste. Although 'Recycling' is an efficient way to control pollution, the ongoing pandemic doesn't allow us to do so since it multiplies the risk of the spread. Most states and countries have temporarily banned waste recycling activities to prevent transmission of viral infection.

However, experts and responsible authorities have come up with a real and effective solution for disposing of waste in this pandemic. They claim to 'SEGREGATE' the waste and then dispose of it. Segregation of household organic waste and plastic-based protective equipment (hazardous medical waste) should be done consciously in every home. Mixing up these wastes increases the risk of disease transmission and exposure to the virus of waste workers. As citizens, we must take responsibility and care for the environment on personal levels. We should not dispose of masks and gloves unsafely, on roads or anywhere on the outside, to prevent pollution and virus transmission.

It is the least we could do to help and support the environment in this tough unavoidable time. The simple, collective, and mindful act of 'segregating and proper disposal of our waste' would be one step ahead in fighting the COVID battle.

INDIA SLIPS TWO SPOTS TO RANK 117 ON 17 SUSTAINABLE DEVELOPMENT GOALS ADOPTED AS 2030 AGENDA: REPORT

-Sangeeta Pandey

India's rank has slipped by two places from last year to 117 on the 17 Sustainable Development Goals (SDGs) adopted as a part of the 2030 agenda by 193 United Nations member states in 2015, a new report has said.

The State of India's Environment Report 2021 revealed that India's rank was 115 last year and

dropped by two places primarily because of major challenges like ending hunger and achieving food security (SDG 2), achieving gender equality (SDG 5), and building resilient infrastructure, promoting inclusive and sustainable

industrialization, and fostering innovation (SDG 9) remain in the country. India ranks below South Asian countries like Bhutan, Nepal, Sri Lanka, and Bangladesh, it said. The overall SDG score of India is 61.9 out of 100. Elaborating state-wise preparedness, the report said Jharkhand and Bihar are the least prepared to meet the SDGs by 2030, which is the target year. While Jharkhand lags in five of the SDGs, Bihar lags in seven.

It said the states/UTs with the best overall score which are on the path to achieving the SDGs are Kerala, Himachal Pradesh, and Chandigarh. There are 17 SDGs that are an urgent call for action by all countries - developed and developing - in a global partnership.

The 17 SDGs adopted by UN member states are SDG1- no poverty, SDG 2-zero hunger, SDG3-good health and well-being, SDG4-

quality education, SDG 5- Gender equality, SDG 6 - clean water, and sanitation, SDG 7affordable and clean energy, SDG 8 decent work and economic growth, SDG 9 -industry, innovation, and infrastructure. The report also said that India ranked 168 out of 180 countries in terms of Environmental Performance Index (EPI) are calculated on various indicators,

including environmental health, climate, air pollution, sanitation, drinking water, ecosystem services, biodiversity, etc.

India's rank was 172 in the environmental health category, which is an indicator of how well

countries are protecting their populations from environmental health risks.



ECO TIP!



SUPPORT COMPANIES
WITH SUSTAINABLE
BUSINESS PRACTICES.

INDUSTRIES MUST NOT OPERATE WITHOUT ENVIRONMENT CLEARANCE, AND STATES WILL HAVE NO POWER OF EXEMPTION: NGT

-Sanyukt Kulshrestha



img source: perfectmentors.in

A key decision came from the National Green Tribunal on 7th June 2021. A bench headed by NGT chairperson Justice Adarsh Goel said that environment clearance is mandatory under Environment Impact Assessment Notification on 14th September 2006. And no authority can permit a unit to function if it violated the law.

A plea filed by an NGO named Dastak against the order of the Haryana government that allowed formaldehyde manufacturer Synochem Organics Pvt. Ltd & Ors.. In which industries were allowed to operate for 6 months if they had made an application for EC within 60 days of its commencement. In a report by Live Law, Dastak had also mentioned that these industries used around 6 lakh liters of water per day that too without the due permission of groundwater authorities. Similarly, they also have been non-compliant with the rules and regulations of manufacture import of hazardous chemicals and storage. Adding to this the Dastak's representative also said that there have been incidences of the destruction of soil, crops, and even groundwater. Untreated hazardous substances have been dumped by these industries back into the groundwater through the process of reverse borewell. And no compensation has been given by the industries. In the defense, the Haryana government said that the relief was provided to these units because the EIA notification of 14th September 2006 is currently being re-drafted by the Ministry of Environment Forest and Climate Change.

Orders and bold steps like these are a well taken initiative for environmental protection from the government. And this especially has significance after seeing the current situation of pollution in India.

WORLD POPULATION DAY



Observed on 11th July every year, World Population day raises awareness regarding overpopulation and the importance of family planning and maternal health. The Governing Council of the UNDP recommended the need for such a day in 1989. World Population Day 2021's theme is to raise awareness of the sexual health of women during the pandemic.

EIFFEL TOWER ILLUMINATED USING RENEWABLE HYDROGEN: A STEP TOWARDS A NEW ERA

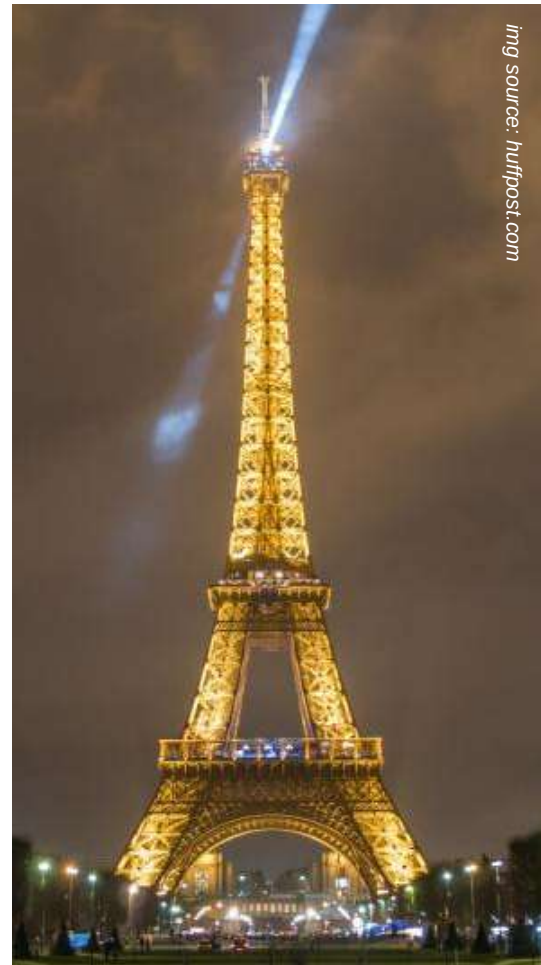
-Sruthi P

Eiffel Tower in Paris, one of the oldest monuments on our planet, has been lit up by electricity produced from RENEWABLE HYDROGEN.

Air Liquide- an industrial gas company supplied the hydrogen used to light up the tower for a laser show during the Paris de l'hydrogène event. It is committed to using hydrogen as a clean energy carrier for various applications, including industrial processes and clean mobility. Organized by Energy Observer, this event creates awareness among the masses regarding the energy transition in general and showcases the role hydrogen could play in France's green recovery. Air Liquide supplied 400 Kg of Hydrogen to run the exhibition village during the event and light up the Eiffel tower. Erev (Energy Observer Developments) developed the electron-hydrogen generator used. EODev's GEH2 generator is emission-free and does not emit any fine particles. Hydrogen generators replaced diesel generators for energy supply.

This alternative solution to light up one of the revered monuments is clearly a symbol that we are transitioning to a sustainable future. With more unified efforts, we might achieve it. The Vice president at Air Liquide, Matthieu Giard, refers to lighting up the Eiffel Tower using renewable hydrogen as an illustration and proof that the solution exists. He also commented that we must collectively pursue initiatives to develop a hydrogen society.

The transition marked by this incident is a historical event as we used an alternative solution to light up the most visited monument in the world in over 130 years



img source: huffpost.com



img source: upi.com

VAN MAHOTSAV

Van Mahotsav, an annual pan-India tree-planting festival celebrated in the 1st week of July, began in the year 1950 as a way to create awareness among people regarding the conservation of forests and the importance of trees and forests in human life. The then Union Minister of Agriculture and Food, K.M. Munshi was the initiator.



ONLY IF ANIMALS COULD TALK

- Jagriti Hinduja



img source: Dmity B unsplash.com

The dream started with a beautiful weather
Walking through the jungle
Clouds were enjoying
Trees were smiling
Air was running around with joy
Oh wait! Who grabbed my hand?
Scared. Panicked. Horror Stricken.
I looked back
And down there, I saw
I saw a red faced monkey
Fear in his eyes
His breath so loud
“Help!” he said with hope
“Aren’t you the monkey I read about last night”
“We are dying help us”
Took me to a place
Animals all around
Gorilla, Chimpanzee, Orangutans, Rhinos, Jaguar
Good weather do them no good
They were sad. They were dying.
Everyone stood silent
Looking into my eyes
All I could perceive was HOPE
All I could think was RESCUE
I woke up. Not from the dream.
I woke up to the reality.
They need care.
They need our help.
We need to take actions.
We need to save them.



img source: thailandfur.com

OVERFISHING

- Ar. Aishwarya Chavan



The increment in the global population of 'fish eaters' has led to a new significant threat to our marine ecosystems disguised in the form of 'Overfishing'. It literally means catching too many fish at one single time, so the breeding population becomes too depleted to recover. Commercial fishing is one such type of overfishing, where massive amounts of unwanted fish or other sea creatures are fished, which eventually are then discarded.

Overfishing has taken a toll on the marine wildlife causing ill effects such as **loss of species, loss of other marine creatures, removal of essential predators, poor coral reef health, growth of algae, threat to local food sources, unintended catches, financial losses, an imbalance of the marine ecosystem, improper aquaculture, rise of the endangered species**. Commercially valuable species such as tuna, swordfish, marlin, cod, halibut, skate and flounder are fished at enormous quantities to the point where populations now are dangerously low. About **70% of the world's species of fish are exploited or depleted** and as per the UN, one in five people on the planet depends on fish as a primary source of protein (that is approx. around 3 billion people). Overfishing endangers ocean ecosystems and hence affects the billions of people who rely on seafood by affecting the fisheries all over the world; also affecting the livelihoods of people. **According to the WWF, if we continue to consume fish at current rates, stocks of all species currently fished for food could be exhausted by 2048.**

The UN's International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) is an attempt to rule out guidelines for sanctions against such activities. However, it does require a unified global effort. On the other hand, fishing regulations are being exploited; one such example is India's Letter of Permit Scheme, run by the country's Ministry of Agriculture, which allows local fishermen to use foreign fishing vessels to access deeper and wider fisheries than normal; also registered with an Indian authority. Violation of this is seen as groups of foreign fishing companies enter the Indian waters by forging their registration papers, transferring the catch to their vessels; which otherwise would have been brought to the Indian shores. This illegal overfishing cost the local industry millions in lost revenue, shaking the country's economy.

INTERNATIONAL TIGER DAY



Held annually on 29th July, International Tiger Day aims to raise awareness regarding the conservation of tigers. It began in 2010 at the Saint Petersburg Tiger Summit, the purpose being to conserve and protect tigers and their natural habitats.

ECO TIP!



BUYPASS THE
ELEVATOR,
TAKE THE
STAIRS.

'Sustainable Fishing Practices' is the key to the on-growing demand. To stop the exploitation of our oceans, we need to take one 'tide' at a time by-

- Applying stringent quotas on the number of allowed fish per haul.
- Limiting the catch quotas.
- Creating more marine protected areas.
- Join campaign and support organizations.
- Stopping to trawl and starting to monitor.
- Educating everyone and spreading the word.
- Making smart consumer choices.
- Working to reduce bycatch.
- Raising the subsidies.
- Labels for consumers (to educate about which fish are endangered due to overfishing)

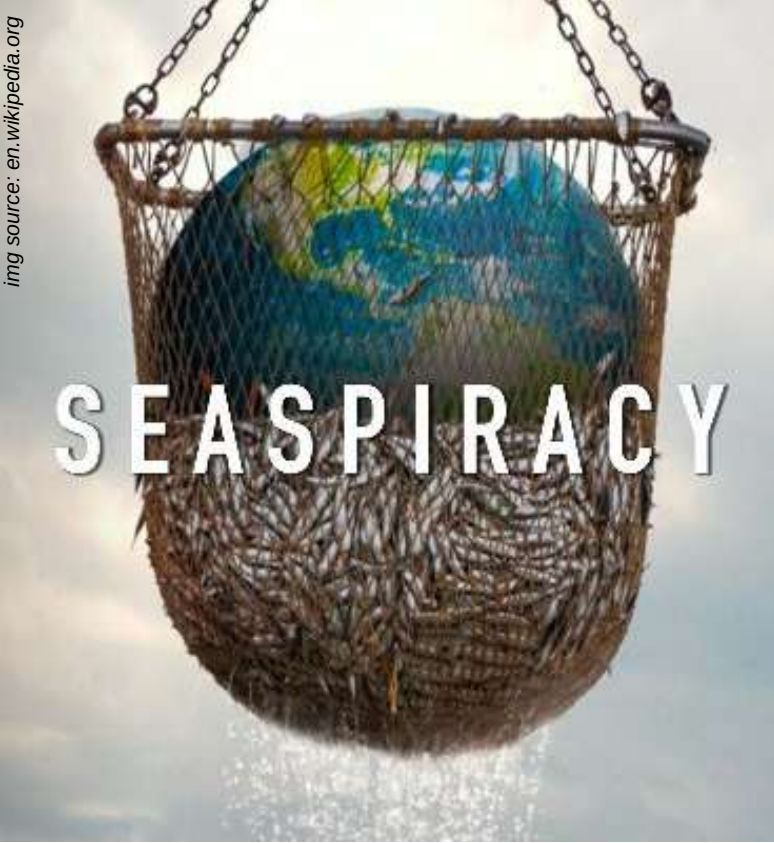
These are some of the important steps that we need to take to protect our beautiful oceans and marine biology. But moreover, we need to uplift our consciousness and work towards a more sustainable lifestyle.

Today is our chance to make a difference.



THE LAST CATCH, Rozina Akhtar

The cartoon portrays a tragic consequence of overfishing to an extent of extinction, Eventually destroying their livelihood. It shows the circle of life, "what you put in comes back to you".



img source: forbes.com

MOVIE RECOMMENDATION

SEASPIRACY

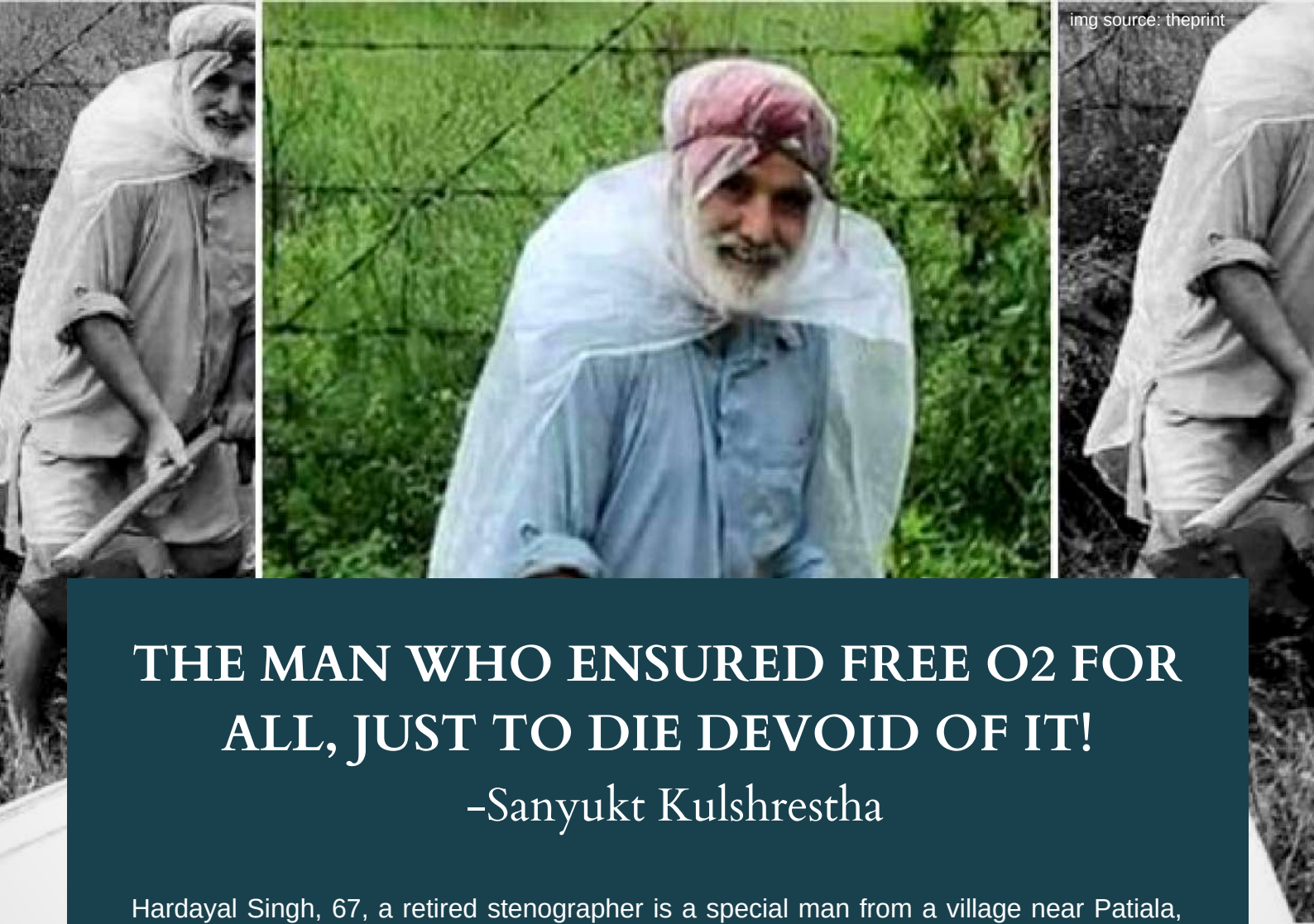
– Arpita Ganguly

The 90 minute Netflix documentary released in March by British Filmmaker Ali Tabrizi unravels the dark side of the commercial fishing industry. It follows investigative journalism into the existential crisis the world is facing from overfishing. While there is a huge debate on the internet among Facts and Fantasy, let's take a deep dive into the threats and solutions.

The Netflix film takes us on a whistle-top tour of our oceans, shining a light on everything from whale stranding, killing dolphins to uncovering the illegal fishing industry. In the past decade, environmental advocates and governments have been pushing for a 'plastic-free society to save the ocean. However, Seaspiracy reveals a much greater threat than plastic. The movie highlighted that overfishing is the current biggest threat to marine biodiversity.

According to conservation.org ***“Three times as much oil is carried out to sea via runoff from our roads, rivers, and drainpipes, more plastic than fish. Eight million metric tons: That's how much plastic we dump into the oceans each year. That's about 17.6 billion pounds — or the equivalent of nearly 57,000 blue whales — every single year”***. The ocean is indeed crucial to humanity and without it, humans will perish.

It is a truly eye-opening and educational film. The revelations were gruesome and deeply disturbing. The movie promotes vegan propaganda. But that is a whole new debate. Seaspiracy is interesting and well researched, highly informative, and extremely shocking. To sum it up, Seaspiracy is a success story, because it has started a debate. It is definitely a must-watch, streaming on Netflix now.



THE MAN WHO ENSURED FREE O₂ FOR ALL, JUST TO DIE DEVOID OF IT!

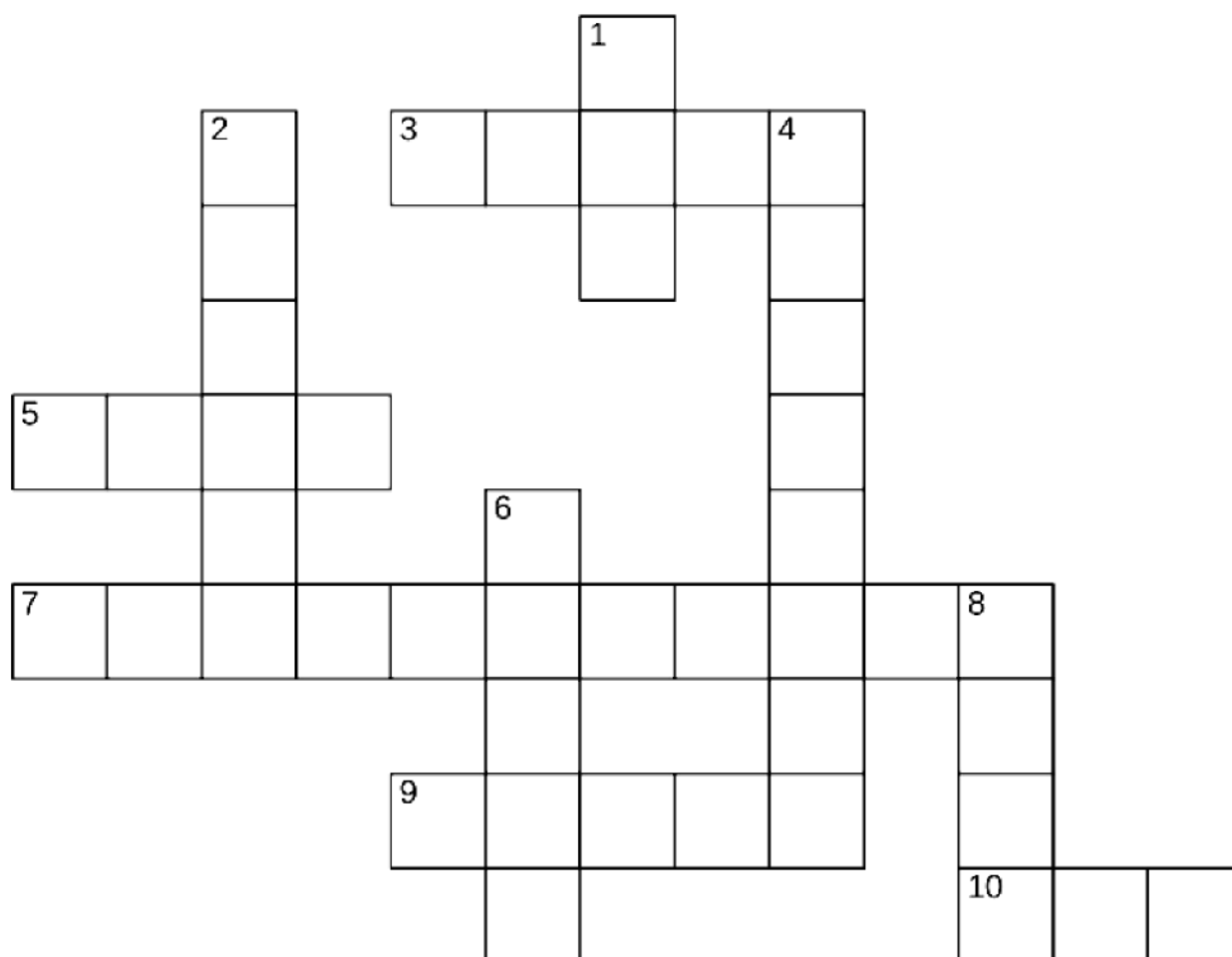
-Sanyukt Kulshrestha

Hardayal Singh, 67, a retired stenographer is a special man from a village near Patiala, Punjab. He is known to have created a 'mini jungle' around the village's crematorium. For years Singh has been seen around the village planting saplings which are more than 10000 in number.

This action was in a way, to ensure pure and free oxygen for the people in the village. Regardless of his contributions, he was not able to get an oxygen bed when he was struggling from covid. And finally lost his battle on May 25th, 2021. He was tested positive for the disease on May 17th, 2021, and developed difficulty in breathing by the next day. The hope of getting a ventilator bed that was needed finally kept shrinking. Finally, after 23 hours, a bed with normal oxygen was procured.

When he for 12 years followed the routine of tying saplings on his cycle and peddling his way to the village crematorium early in the morning. His wife Kulwinder Kaur, 54 now remembers that she asked him repeatedly to travel on his bike. Even when he had a knee problem, he always used to reply that the bike would cause pollution," his wife said. He was a true believer in creating small jungles. As these were the only weapons against pollution. Some years back he fought a case to stop a peepal tree from being chopped off by authorities to construct a power grid. He won that battle but could not win his life back. However, the saplings he had borrowed from the government nursery still have hope. His sons Damanpreet Singh and Dilpreet Singh and his wife have decided to keep his legacy continued.

CROSS WORD



ACROSS

3. 40% of premature deaths caused by air pollution were in ____?
5. Can Air pollution affect animals? True or False?
7. This was enacted in 1963, by the 88th US Congress
9. Air pollution kills over _____ million people each year
10. What is the abbreviation of the government agency that protects the environment?

DOWN

1. China, along with India, contains over 50% of the world's sources of _____ pollution
2. Air pollution can affect your _____ system
4. A type of rain that is caused by air pollution
6. Acid rain harms vegetation and _____ life?
8. Can air pollution affect humans? True or False?



- Sanya Sibal

'Re-using' waste is one of the efficient ways of fighting pollution and creating aesthetically appealing objects.

Here in the picture is just one way of decorating a bottle with shells, plastic, laces, and jute thread.

We all have a little creativity in us. So let's put on our thinking caps by re-using and re-utilizing our household wastes to make our house look prettier and our environment greener!

CREDITS

EDITOR

ASSOCIATE EDITOR & GRAPHIC DESIGNER

CONTENT WRITERS

CARTOONIST

OTHER TEAM MEMBERS

: AISHWARYA RAJESH CHAVAN

: SANIYA BAGDI

: ROZINA AKHTAR, KHUSHI KAUSHIK,
DR. POOJA TOMAR, SRUTHI P, JAGRITI
HINDUJA, ARPITA GANGULY, SANGEETA
PANDEY, SANYUKT KULSHRESTHA

: KHUSHI KAUSHIK, ROZINA AKHTAR

: VIPIN KUMAR, KALPAK MANOHAR
PIMPALE, SOURAV NEBHNANI, RITIKA
SEN



Earth Root Foundation

www.earthrootfoundation.org

info@earthrootfoundation.org | +91-8766317774