

## **Smog Tower : To Help Tackle Rising Levels of Air Pollution.**

MR.PIYUSHKUMAR VASUDEVBHAI UPADHYAY

Chemistry Department

*Shri R. P. Arts, K. B. Commerce and Smt. B.C.J. Science College. Khambhat,  
Gujarat, India.*

### **Abstract:-**

The World Health Organisation (WHO) says that India has 6 of the top 10 most polluted cities in the world. National Capital Delhi sitting on the top of the list. According to a Greenpeace report published last year, 1-2 million people die every year in India due to air pollution. In the light of such severe air condition, all the institutions, corporate houses, social pressure groups, and the concerned governments are striving hard to improve the condition of air quality through out the country. Worth to mention that China has passed through such severe air condition and chines government has installed the smog tower in Xi'an in the Shaanxi province. India is also planning to take the same initiative. A Delhi-based company "Kurian systems" has recently got the patent of the World's largest air purifier. Smog towers of the kind purpose may reduce pollution for about a square kilometre around them. The localised nature of their effectiveness also makes a case for them. Local governments have very few option to deal with air pollution. Delhi can not solve the problem unless Punjab and Haryana change their policies.

### **Key words:-**

Air purifier, Cufflinks, Emissions, Installed, NOx (Nitrogen oxides).

### **Introduction:-**

In China, a similar smog tower has been able to compress the carbon waste generated to produce gemstones. The project is a collaboration between Indian Institute of Technology (IIT) Bombay, IIT-Delhi and the University of Minnesota, the latter having helped designed a similar tower of over 100 meters in China's Xi'an city. The Central Pollution Control Board (CPCB) will also be involved with the project. China, which has been battling air pollution for year, has two smog towers in its capital Beijing and in northern city Xi'an. The Xi'an tower is dubbed the world's largest, and has reportedly brought down PM (Particulate Matter) 2.5 by 19% in area of around 6 sq km in its vicinity. The 100-meter (320 feet) high tower has produced 10 million cubic metres of clean air every day since its launch and on severely polluted days, is able to bring down smog close to moderate levels, according to the South China Morning Post. The tower in Beijing, built by Dutch artist Daan Roose Gaaerde, has been able to compress waste generated during purification to produce gemstones, according to the TED ( Technology, Entertainment, Design) conference website. Upon compression for 30-40 minutes, the smog particles turn into dark gems, which are used for rings and cufflinks. Smog towers are structures designed to work as large-scale air purifier. They are usually fitted with multiple layers of air filters, which clean the air of pollutants as it passes through them. After the cleaning, the tower releases clean air.

The smog tower-like device essentially sucks up smog like a vacuum from the top and then releases the filtered air through its six-sided ventilators, by charging the smog free tower with a small positive current, an electrode will send positive ions into the air. These ions will attach themselves to find dust particles. Smog towers can only filter out the particulate matter from the air, they can not control the level of other serious pollutants like Nox-majority emitted from the tailpipes of vehicles and burning of fuels in industries. The solutions like smog towers will work only when we successfully control the emissions from the sources, i.e. from the tailpipe of the automobiles and industries, which as of now can only be done by promoting the use of green fuels and pollution control device. Everyone can do their part to reduce smog by changing a few behaviours, such as.

- Drive less.
- Take care of cars.
- Fuel up during the cooler hours of the day-night early morning.
- Avoid products that release high levels of VOCs (Volatile organic compounds).
- Avoid gas-powered yard equipment, like lawn movers.

### **Methods and materials:-**

In a city like Delhi, is an open outdoor environment , where pollution levels are high, weather is dynamic and source of pollution multiple, investing in such device is not feasible. Here are five things you need to know about Delhi's first smog tower or giant air pollution.

#### **1.Height**

The smog tower is 20-ft-tall. It has been erected on a four feet high platform on a covered drain, near Veer Savarkar Marg in Lajpat Nagar Central Market. The total height from the road level is 24 ft last year. China built the largest smog tower over 328 ft high Xi'an is Shaanxi.

#### **2. Cost**

The cost of the device is 7 lakh. It has been produced by Gautam Gambhir foundation and has been installed with the help of Lajpat Nagar Traders Association. The running cost of the device will be around Rs. 30000, which will be borne by the trader's association.

#### **3. Design**

It is cylindrical in design and built like a pole with a big inlet and four outlet units. The giant air purifier is fitted with exhaust fans to suck in polluted air with the help of a big inlet unit. It is painted in four colour – orange on top, white in the middle, green colour just above the bottom and blue at the bottom. The tower will run on electricity.

#### **4. Area of influence**

This smog tower will purify the air within a circumference area of almost 500 meters to 750 meters. The purifier aims at treating 250000 to 600000 cubic meters air per day and release fresh air in return.

#### **5. Pollutant it will treat**

A machine fixed inside the tower will remove nearly 80% of the particulate matter i.e. PM (Particulate Matter) 2.5 and PM (Particulate Matter) 10 and help to bring down pollution levels and spew fresh air out through four outlet units. The 'smog tower' in Delhi, the giant 20-ft-tall device has been installed at south Delhi's popular Lajpat Nagar Central Market, the 'smog tower' purifies air in Lajpat Nagar Central Market, which sees an average foot

ball of nearly 15000 people every day. The smog towers were to be installed on the lines of China, which have experimented with this technology.

Expert, however, have questioned the feasibility of the project given that Delhi is a congested city where space is at a premium. Anumita Roychowdhury, executive director (Research and advocacy) at Centre for Science and Environment said that there was no data available to establish that these towers clean up outdoor ambient air quality.

### **Results and discussions:-**

#### **Benefits of smog towers**

- Smog towers can be useful in an area where there is too much smog.
- Smog towers can be provided in open public places such as gardens or where people gather to get clean air.
- Low power consumption does not require any special enclosure for its power source.

The smog tower works with the goal that it helps to decrease approx. 94% of air borne particles issues. This convert coarse and ultra fine dust particles into coarse build up. This contraceptive is arranged as a crest in such a way that, like a vacuum, it sucks the dark clouds present in the earth from above and then release the isolated air through its holes. Hence, experts have questioned the feasibility of smog towers. According to experts, smog towers were not suitable for Delhi's meteorological condition. There is not enough evidence to prove that the anti-pollutant tower can significantly improve air quality they claim. Experts say the tower is not reducing pollution, even in the area around it. When five experts-including scientists associated with care for air –visited the tower, they found the levels of lung-damaging PM (Particulate Matter) 2.5 particles some distance away from the towers were lower than those close it. "The only way to clean our air is to stop pumping pollutants into it." Scientist said, " we have to control the emissions at their source, such as making coal-fired power plants to conform to emission norms, ensuring a clean and reliable mass transit system, and improving waste management by stopping incineration. The money being spent on smog towers would be put too much better use on these proven measures rather than experimenting with failed technology".

One scientist said " Like China and other countries, where these towers are installed for combating air pollution due to smog, but in India, the major cause of air pollution is not the smog but the smog and high concentration of dust in the air." Hence, those towers may not be effective to control air pollution in India cities. Now, one another scientist said that " We do not have any data to establish that these towers clean up outdoor ambient air quality. Also, nowhere in the world have we seen any data published to establish that this technology improves air quality." All these statements indicate that the effectiveness of smog tower to control air pollution in India is still questionable. Smog towers can only filter out the particulate matter from the air, they can not control the level of other serious pollutants like NOx (Nitrogen oxides) -majority emitted from the tailpipe of the vehicles and burning of fuels in industries.

### **Conclusion:-**

If one draws only one conclusion from this, and previous attempts at removing pollution from air, it is that it is far, far easier to come up with technologies and schemes that stop harmful emissions at source, rather than to try to capture the resulting pollution once its free and in the air. If smog towers are effective, they could be an option for local government.

In the future, the decision regarding the installation of a smog tower could be left to a local government. The biggest drawback is that you need to change the air purifiers at regular intervals. Alternatively, by products that have a filter change alarm to notify you in case the filters need a replacement. The noise is due to the speed of the fans, you can reduce the noise by reducing the speed of the fans.

### **References:-**

- [1].Burlein, Christain (2018-02-17) Smog free tower by Daan Roosegarde in Krakow Poland. Floor nature.com. Retrieved 2019-01-05.
- [2]. "Cleaning the air". The surface transportation policy project.19 Aug.2003. Archived from the original. On 8/2/2007. Retrieved 26/4/2007.
- [3]. Dag Roll, Hansen-'Impact on Environment'. 2010.
- [4]. "Delhi blanketed in thick smog, transport disrupted".18 Dec.2013. Retrieved 18 December 2013.
- [5]. Gardner, Sarah (14 July 2018). "smog : The battle against air pollution". Market place.org. American public media .Retrieved 6 November 2015.
- [6]. India, press of (2018-11-04). " This made in India smog tower, dubbed world's largest, could save Delhi". Business standard India. Retrieved 2019-11-18.
- [7]. "Made-in –India smog tower. Spells hope for Delhi, can clean 130 crore life of air per day". The better India. 2018-11-05. Retrieved 2019-01-05.
- [8]. Mr. Prashant prallhad padasalkar, Dr. Sachin V.Admanr, " Skill graph & training"-.need analysis of smog control, International pollution issues. ISSN: 2321-8169 volume :3 Issues: 5,2009.
- [9]. "Pollution increasing lung cancer in Indian women". 3 Feb.2014. Retrieved 3 Feb.2014.
- [10]. "Smog city to clean capital how Delhi did it". Express India. Archived from the original on 31 December 2010. Retrieved 11 March 2011.