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Air Pollution in China and India: Drawing Parallels

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Abstract: The following article is an attempt to draw similarities in the condition of air pollution in China and India. It has looked at a few factors that affect air quality in the two countries and mentions the current air quality statistics. China has been suffering from pollution since a longer time than India as aggressive manufacturing in China began earlier and hence, environmental deterioration also suffered earlier as compared to India. So, in this article we look at whether India can learn from China's experiences on the same.

Keywords: Air pollution, Environment Performance Index (EPI), Sulphur emissions, Yellow sand.

I. Introduction

India and China have shown a remarkable growth trajectory and currently stand at a GDP growth rate of 7.2% (India) and 6.9% (China). Industrialization fuelled the economy of both countries and since 2000s both the countries keep getting better. Urbanization, Fuel consumption, consumerism has led to environmentally degrading activities in China and India and according to the survey of 180 countries in 2016 Environmental Performance Index (EPI) India ranked at 141 and China ranks at 109 [1]. EPI is a distinct approach to calculate environmental performances of the countries by incorporating resources consumption, pollution statistics, depletion of environmental assets and biodiversity loss [2]. EPI scores countries based on nine priority areas comprising of 19 indicators [3]. The interesting analysis in the present EPI scoring of China and India has been their low ranking despite high GDP rates. Air pollution statistics played a crucial role in determining these rankings for both the countries.

II. Air Quality in China and India

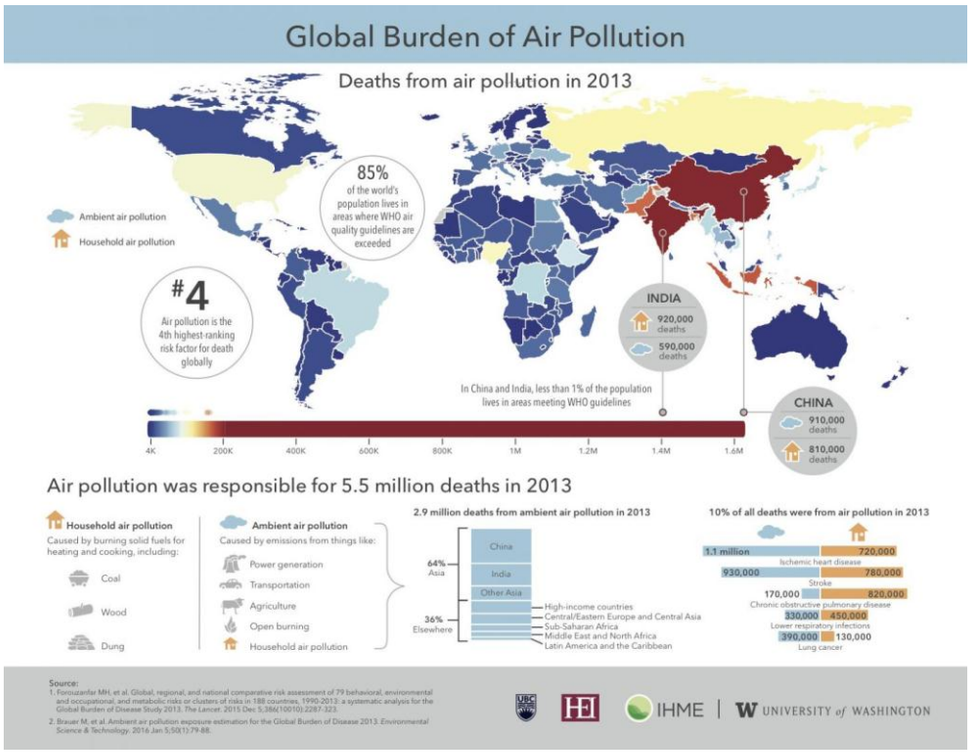
The burning of fuel (industrial and vehicular), and waste leads to the development of toxic air pollutants like particulate matter, oxides of carbon and sulphur and mercury. The prime fuel used for energy production in China is bituminous coal [4] and analyzing the coal production in China from the year 2000 (1.00 billion short tons) to 2014 (3.89 billion short tons) it is observed that the production has increased with each passing year and four-folded by 2014 [5]. The sulphur emitted from burning of coal coagulates with water in the air and falls back in the form of acid rain which degrades the quality of soil and harms forest cover as well. As per the records of the Worldwatch Institute (2015), forests in the provinces of Sichuan, Guangdong, Heibei, Jianxi and Guizhao suffered severely due to such acid laden rains [6]. Lax behavior of monitoring authorities and lack of co-ordination on data analysis further aggravates the problem [7]. Vehicular emissions, coal-burning for cooking, heating and power-plant operations are other key factors in increasing urban air pollution [8].

India is also industrializing and in comparison to China uses a mix of energy resources, coal figuring at 44%, biomass and waste 23%, petroleum based 23%, natural gas 6% and other sources [9]. Major sources of air pollution in India basically come from industrial emissions, power stations and vehicular emissions which add suphur, nitrogen oxides and fly ash in the air. Refineries in Mathura have been affecting Taj Mahal since many years and have been a concern [10]. Burning of crop residues, waste combustion and unadulterated fuel usage adds to pollution statistics.

III. Consequences of Air Pollution in India and China

China and India are second and third largest greenhouse emitting countries respectively, in the world. Respiration of such air leads to a lower life expectancy rate, and currently it reduces around 3.5 years in the life of an average Indian and cuts down around 3 years in the life of an average Chinese citizen. As per a report of World Health Organization (WHO) number of deaths due to air pollution are higher than that of water pollution. The repercussions are apparent in the statistics of World Health Organization where six cities of China and 12 cities of India figure in world's top polluted cities [11]. And consequently, most number of deaths occurs in China and India due to air pollution as shown in the Fig. 1.

Relevant monitoring statistics of 2016 show high levels of particulate matter in most of China and India [12] where both natural and anthropogenic sources contribute to particulate concentrations in the air; Particulates are the major pollutant affecting air quality in China [13] and India. Statistics of 2016 show that concentration of particulates in 62.8 percent of cities had met or exceeded a Grade II standard, up by 3.3 percentage points from the previous year. Meanwhile 5.3 percent of cities surpassed a Grade III standard, down by 0.2 percentage points. On Comparing with data of 2015, overall particulate pollution alleviated to some extent [14].



Source: Institute for Health Metrics and Evaluation (IHME), University of Washington 2015 [15]

Fig. 1

Around 3,283 people in India and 3,233 people in China die every day due to air pollution [16]. It has been proved through multiple studies that prolonged exposure to air pollution results in severe health repercussions such as asthma, bronchitis, cancers, heart diseases and tuberculosis. Children are most affected by air pollution and around 600,000 children under the age of 5 years die every year, with the majority of them being from India, China and Nigeria [17]. A study reveals that children of China and India are growing up with irrecoverable lung damage (children are developing lung cancer due to air pollution in China) [18].

The costs of air pollution to welfare losses associated with clean-up and health related to air pollution are extremely high in India and China, it costs around 6.5% (country's GDP) annually to China and in India it was around 8.5% of the GDP [19].

IV. Solutions: Lessons from China

Whole of East Asia is reeling under pollution and the disbelief that environmental degradation is inevitable during development has aggravated the situation. India and China both are facing severe pollution and are a cause of concern. Chinese government has started to take serious regulatory measures for its environment. In his address to China's National People's Congress on March, 2016, Chinese Premier Li Keqiang called for "heavy blows" to be struck against air and water pollution that have exacted heavy toll on large swaths of the world's most populous country [20].

Li cited targets to improve environmental standards across the board, but focused in particular on measures to tackle urban smog that would deliver "good air quality" day readings for 80% of the year. The targets are part of the 13th Five-Year Plan (FYP), a policy blueprint that will shape China's economic development over the next five years upto 2021. He stated that "achieving green growth means reducing energy and resource intensity and decoupling the emissions of key pollutants from economic growth and urbanization". In fact, since the implementation of 13th FYP the energy intensity per unit GDP has dropped by 18.2% and emissions of key pollutants by 12%. India could also keep all these things in mind during the setting up of "Make in India" programme.

Planting trees is another activity that can promote cleaner air. In December 2002, Chinese state enacted regulations that individuals or businesses would be awarded with remunerations if they converted farmlands to forests, and both the central and local government agencies would reimburse the cost apart from the awards but the major funding for this project comes from Japan and Korea [21].

China has an active project to plant trees in Tianshiu to control erosion, financially supported by the Japan Bank for International Cooperation (JBIC), to aim at regulation of ecosystem of yellow sand generating areas. JBIC aided $1.2

billion to this cause in 2004, and eventually $39 million were invested in the Tianshiu area. Environmental cooperation between China and ROK initially started as a non-governmental activity but transcended to cooperating research and regulations on trans boundary environmental issues, esp, yellow sand and acid rain. Korean Forest Service funded a $5 million project to reforest five areas of western China [22].

Source control, air cleaning and efficient fuel usage can be a solution to bring the polluting matter. In source control, India can monitor the quality of petroleum products used as fuel and China needs to cut-down on its coal usage. Crop-burning in India is another major issue. Regulations and laws related to crop burning do exist but monitoring authorities do not function as required and therefore, farmers continue to burn their crop residues without any fear of attracting penalties. Shifting to public transport also serves as a mitigation on air pollution as seen in Delhi where carbon load decreased with the introduction of CNG fuelled buses and metro.

This article is to show that India stands a better chance of nipping pollution in the bud and not suffering extreme fate of the environment in China.

V. Conclusion

Various international reports of 2016 like "The Global Green Economy Index", "Ambient Air Pollution Database WHO", "the Environment Performance Index "OECD reports mention that India and China are one of the most polluted countries of the world. China has been working to improve its environment, because of local and regional (Japan and Korea) pressures. As per figures of NASA, the figures of particulate matter (PM) fell in China by 17% while it rose by 13% in India during the time-period of 2010-2015. In fact the figures of Delhi stay 2.5 times higher than Beijing and around 15 times higher than the WHO guidelines. China has setup targets for air quality and a comprehensive monitoring system keeps a tab on the polluting sources and heavy fines are levied on the violators. Restrictions on vehicle ownership and usage and strict monitoring of coal-fired power plants and steel factories are in effect.

Control of pollution basically depends on the willingness of the government and China has started to take necessary actions. India is yet to wake up to the seriousness of the issue. Development and environmental regulations are also considered contradictory, like India launched it's "Swachh Bharat Abhiyan" on October 2, 2014 to reduce pollution but another project "Make in India" that focuses on industrialization was also launched in September the same year. China had also done the same things when it worked to become "manufacturing hub of the world". China has been affected by severe pollution since last decade or so and being a neighbour of advanced nations like Japan and Korea received technical and financial support to improve its ecosystem and now, after a considerable time results are visible. India, on the other hand, realized the adversity of pollution since last few years therefore; currently environmental statistics do not speak in favour of India. But looking at the similarities in the trajectory of development of China and India, India can skip the process of trial and error after taking pointers from China and develop an effective environmental governance system and the results would be sooner than expected.

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[3] Environment health, being the first policy objective, is given 50% weightage and it comprises 3 categories viz. health impacts, air quality and water and sanitation, each given 33% weightage in the score within; whereas ecosystem vitality, being the second policy objective, is again given 50% and it comprises 6 categories viz. water resources (25%), agriculture (10%), forests (10%), fisheries (5%), biodiversity & habitat (25%) and climate & energy (25%).

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[13] PM10 is particulate matter 10 micrometers or less in diameter, PM2.5 is particulate matter 2.5 micrometers or less in diameter. PM2.5 is generally described as fine particles. By way of comparison, a human hair is about 100 micrometres, so roughly 40 fine particles could be placed on its width. Particles of any substances that are less than 10 or 2.5 micrometres diameter. Particles in this size range make up a large proportion of dust that can be drawn deep into the lungs. Larger particles tend to be trapped in the nose, mouth or throat. Its value in the air, less than or equal to 50 indicates attainment of the Grade I standard, 50-100, 100-200, 200-300, and larger than 300 are called Grade II, Grade III, Grade IV, and Grade V standards, respectively.

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