

“Pollution and Economic Development in Indian Metro Cities”

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OBJECTIVES

Pollution is a concern that has been identified to be affecting the economy only since a few years. The main objectives of this paper include establishing such a relationship and giving the required evidence and proposed solutions for the same. The objectives of this paper can be can be enlisted as follows:

- To establish a relationship between pollution and the economy,
- To identify and analyze the various sectors of an economy most affected by pollution,
- To make an attempt to explain the effect of pollution on the standard of living of people,
- To explore the potential of carbon trading with special emphasis on the Indian economy and site loopholes in the model,
- To study the feasibility of carbon trading in the Indian economy
- To draw useful conclusions regarding the impact, sectoral effects, and social effects of pollutions and study possible solutions for the same.

RESEARCH METHODOLOGY

The major theme for the paper, that is, pollution, is selected and then researched on to find the specific areas this paper would like to explore. The data collected for the purpose of this research is majorly secondary data. Data quantifying the impacts this paper expects to study is collected from trusted sources on the Internet. This data is then analyzed and related to the problems being discussed in this paper. The analysis is done by figuring out the variables and in all available data and graphs significant and relevant to the topic of study, and then making relevant connections with the topics under study.

The analysis is then made use of to draw useful conclusions and also site loopholes in the previously proposed models for the problem in hand.

LITERATURE REVIEW

Harvey Rosen (2005) : Public Finance, Chapter - 5

Herein, the writer has talked about cap and trade market in economic terms, he has compared this method of reducing pollution with other methods (Pigouvian tax). Through this paper, we analyze this theory, its applicability and implementation in the 21st century.

To understand the impacts of pollution on standard of living, the experiment by Chay and Greenstone (2005) was reviewed, since using regression analysis and quasi - experiments, a researcher can estimate the correlation between pollution and housing prices.

Shreekant Gupta's paper on 'Economic Impact of Air Pollution on human Health', which studies the impact of pollution on human health.

Introduction

Generally, pollution is described as an introduction of added substance in our environment which causes a serious issue to us and adversely impacts the nature. The contamination of the environment by the substances that adversely affect the human health and other living beings leads to pollution.

Pollution can be of many types: air, water, soil, land, noise, nutrient etc. caused by a host of factors and leading to many negative consequences.

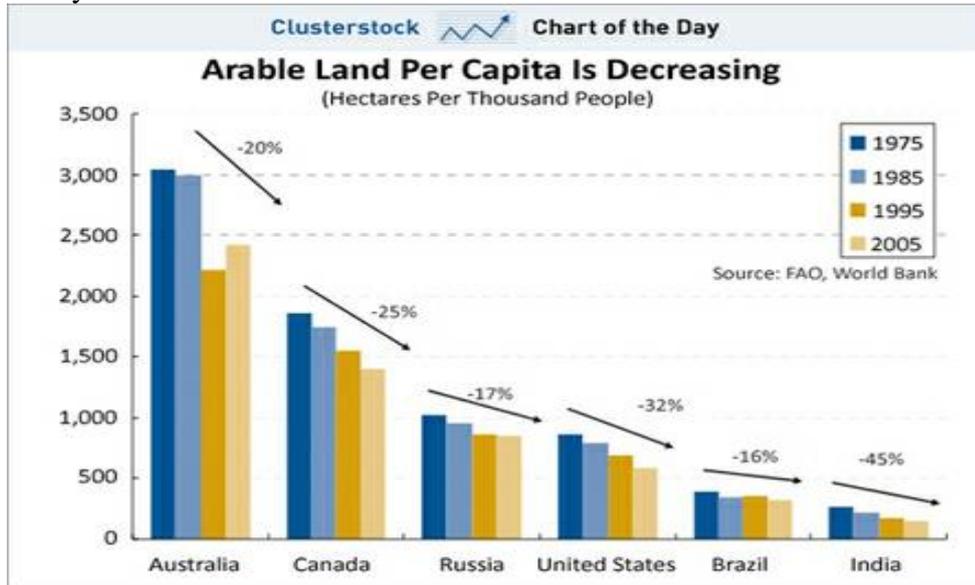
But what is interesting is the fact that pollution is linked to economic development of a state, both directly and indirectly.

Sectors affected by pollution

There has been clear evidence that pollution affects the economy as a whole but there are sectoral effects which are often unexplored. Pollution affects the following sectors of the economy in the following ways:

➤ **Agriculture**

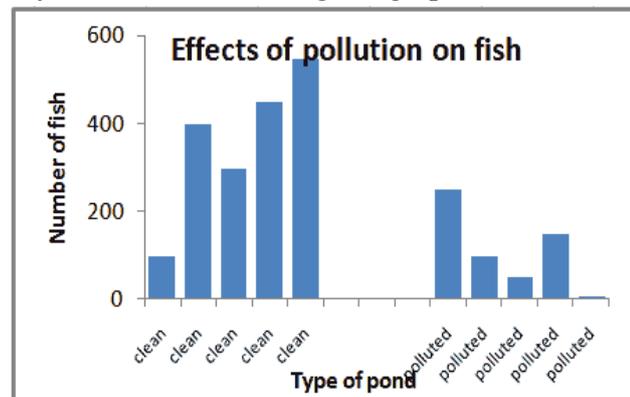
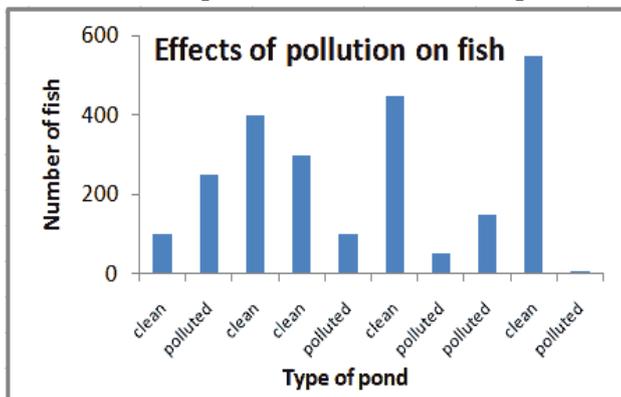
There has been increasing evidence regarding the deterioration of agriculture because of increasing soil, land, and water pollution. The groundwater is also contaminated by the pollutants released by industries without treatment. This causes the use of synthetic measures like the use of pesticides and fertilizers to get a good crop. The arable land available for farming has also declined because of the alarming increase in the soil pollution. This effect can be illustrated by the following graph by Dundee Securities;



Source: Dundee Securities

➤ Fishing

Water pollutions makes the water in the oceans, seas and rivers inhabitable and inhospitable for some species and deteriorates the health of some others. This effect can be quantified and explained by the following graph:

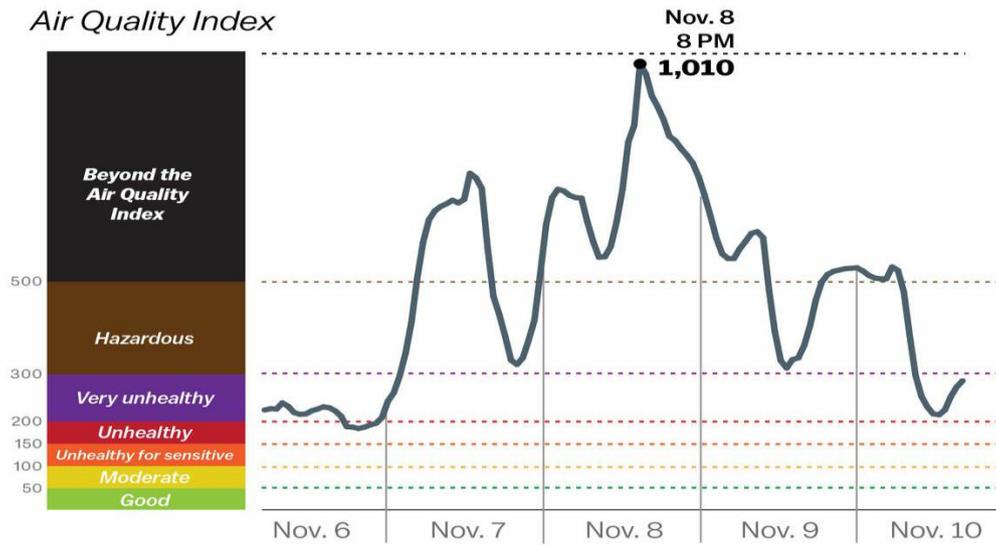


Source: Fish Community, WordPress.com

➤ Tourism

Before planning a trip, people research and base their decision of the place to travel to on many factors, like, the air quality, the water quality to talk of a few. For example, the increasing knowledge about the deteriorating air quality in the metro city, Delhi has caused some people to consider migrating and a lot of tourists leaving Delhi before their planned departure because of increased pollution. A majority of foreign tourists had already left the hotels of Paharganj, one of the most famous hubs for foreigners in Delhi. Hoteliers said that the reason was rising pollution.

When Delhi became the most polluted city on Earth



Source: US State Department

Vox

Pollution and standard of living

The quality of the local living environment has a direct impact on human health and well-being. An unspoiled environment is a source of satisfaction, improves mental well-being, and allows people to recover from the stresses of everyday life and perform physical activities. Access to resources such as green spaces, forests and rivers is an essential aspect of quality of life. Economies rely not only on healthy and productive workers, but also on natural resources.

21st century has witnessed people being concerned for the quality of environment they live in. People today are more particular for the air they breathe and water they consume.

For instance, considering two identical houses, situated in identical neighborhoods, except the fact that one is situated in a polluted area and the other isn't. The house in the unpolluted area will have a higher price. This price difference shows the willingness of people to pay for a cleaner air.

Empirical evidence

Chay and Greenstone [2005] analyzed a quasi - experiment to estimate the relationship between pollution and mean housing values in a country. They relied on a legislation in the 1970s that set a limit on emissions. They found that due to the regulation, there was a sharp drop in emissions, which led to a \$45 billion increase in the housing values between 1970 and 1980.

It has to be noted, that the assumptions made prior to the study can't be ignored. In reality, people may be ignorant about the effects of air pollution on their health. Also, there may be other factors impacting housing prices and air quality.

Potential of carbon trading in India

The need for carbon trading was felt when it was realized that the industries have been the biggest polluter of greenhouse gases which has resulted in depletion in quality of environment.. A lot of effort was put in to bring the attention of the world towards the problem of global warming. But this issue was not taken very seriously as a result of which nothing much was done in this regard. Thus it was realized that the only way to get the attention of the world towards these problems was by attaching some financial incentive to it. As a result the concept of Carbon trading was introduced. Carbon trading is a market - based approach, which aims to reduce the pollutants and emissions by providing economic incentives. The companies failing to meet the emission targets are penalized heavily.

Clean Development Mechanism

The Clean Development Mechanism (CDM), defined in Article 12 of the Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. The CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO₂. These CERs can be traded and sold, and used by industrialized countries to a meet a part of their emission reduction targets under the Kyoto Protocol.

The mechanism, thus, stimulates sustainable development and emission reductions.

Carbon Trading in India

Indian industries were able to cash in on the sudden boom in the carbon market making it a preferred location for carbon credit buyers. It was expected that if India could capture 10% of the global share of CDM, the annual revenue would range from US \$10 million to US \$300 million.

But sadly, the market has started declining globally. This is primarily due to the fact of oversupply in the market.

It was also noted, that this mechanism didn't lead to a decrease in pollution actually. Companies tended to reduce one pollutant, and got paid for the same. Practically, they were increasing the emission of other pollutant, which wasn't taken into account. This led to an increase in pollution.

In case of India, owing to a huge number of manipulations, the carbon credits lost their credibility in the global market. The market which actually holds a huge potential, is in shambles.

Examples of Carbon trading in India

There are numerous examples, which prove how revenue can be generated from carbon trading in India.

Jindal Vijaynagar Steel

The Jindal Vijaynagar Steel had declared that it could sell \$225 million worth of saved carbon. This was made possible since their steel plant uses the Corex furnace technology which prevents 15 million tonnes of carbon from being discharged into the atmosphere.

Powerguda in Andhra Pradesh

By extracting biodiesel from 4500 Pongamia trees in their village, it was claimed that 147 MT of Carbon Dioxide was saved which could lead to generation of a huge revenue.

Handia Forest in Madhya Pradesh

In Madhya Pradesh, it was estimated that 95 poor rural villages could earn US \$300,000 every year from carbon trading by restoring 10,000 hectares of degraded community forests.

Need of the hour : sustainable over economic development

When the Industrial Revolution began, the main objective of every economy was to boost the economy. This was a major concern in the 19th and 20th centuries, and still is in some countries. Now that economic objectives have been achieved to some extent, the need of the hour is to move towards sustainable development instead of simply targeting economic development. Sustainable development is the development that is conducted without the depletion of natural resources. The United Nations' Sustainable Development Goals target 2030 is also a campaign to emphasize on the importance and need of Sustainable Development in today's day and age. If economies continue to move at the current pace, there will be a satiation point, beyond which, the economy won't be able to develop, and will, in fact, start deteriorating because of the damage caused to the natural resources. Sustainable development needs to be prioritized before economic development considering the amount of damage caused and the amount of pollution caused by the economy. To have a sustained Economic development in the long run, Sustainable Development goals need to be practiced.

Conclusion

Even though India is the largest beneficiary of carbon trading and carbon credits can be traded on the MCX, it still does not have a proper policy. Owing to the increase in pollution, especially in the metro cities, there lies a big incentives for Indian Industries to reduce pollution. This would have dual benefits. Not only this would reduce the mounting pollution in the cities, but this would increase the revenue of the companies. Here, we establish yet another relationship between pollution and development. Given the potential of carbon trading in India, a decrease in pollution would add to the economic growth of the nation, not

only with respect to the returns from trading, but also, because a cleaner and greener environment would imply a healthier human resource for the nation.

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