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ENVIRONMENTAL ACCOUNTING IN INDIAN COMPANIES: LET GO OR LET'S GO

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Abstract

India's economic growth over the past few years has raised the prospect of eliminating extensive poverty within a generation. But this growth has been clouded by a degrading physical environment and the growing scarcity of natural resources that are essential for sustaining further growth and eliminating poverty. It is no coincidence that the poorest areas of the country are also the most environmentally-stressed regions, with eroded soils, polluted waterways, and degraded forests. Simultaneously, rapid growth has unleashed greater public awareness and an unprecedented demand for the sound management of natural resources including air, water, forests, and biodiversity. Environmental sustainability is rapidly emerging as the next major development and policy challenge for the country. It is matter of concern that we have to think seriously about environmental pollution is natural phenomenon or product of development greed. But growing pollution creates alarming situation for Indians. People have to decide growth on sake of environment or sustainable growth that add happiness in people life and protect natural environment as well. It is duty of people and government to force companies to take concrete steps to save environment.

Keywords: *degradation of environment, rapid growth, public awareness, sustainable growth*

Introduction

The relationship between pollution and economic development has been widely debated across various disciplines in the natural and social sciences. The prevalence of the Environmental Kuznets Curve (EKC) has blurred the more complex relations between economic development and environmental outcomes, despite the limitations of the EKC to consider ecological carrying capacity concerns. Moreover, the empirical isolation of many studies in highly specific disciplinary contexts has hitherto prevented us from considering an integrated framework for analysis. As we consider ways of moving towards a circular economy in which pollution itself could be harnessed as a material asset for usage in products to diminish waste, a more integrated framework is needed. This is particularly true in developing countries where pollution rates are rising most dramatically and where governments and firms are often being confronted with conflicting narratives about the impact of environmental regulations on economic growth and broader human development. The relationships between pollution and economic development are complex with several possible feedback loops that are predicated on drivers and

consequences of economic growth, ecosystem resilience and the ultimate reliance of financial capital on nature. The aim to achieve the sustainable development goals (SDGs) is an opportunity to revise and organize the debates between pollution and economic development.

Historically, the modern ecological movement, which started in industrialized countries in the 1960s blamed economic development as the main driver of pollution. Studies, such as the Report of the Club of Rome (Meadows *et al* 1972), suggested that if the economy continued with the same pattern we would deplete natural resources and reach unpredictable, and perhaps unacceptable, levels of pollution, advising zero growth as an alternative to environmental and human catastrophe. Zero or negative economic growth emerged as the ardent environmentalist's solution for ecological problems, particularly in more industrialized countries at the time, as economic growth and a clean environment appeared to be antagonistic and interchangeable. The environment-economy antagonism permeated the debates during the UN Conference on Human Development in Stockholm in 1972. However, some dissenting voices, such as the prime-minister of India Indira Gandhi, argued that poverty, or lack of economic development, can also be problematic to environmental pollution (e.g. lack of sanitation) (Gandhi 1972). Indeed, later on, we found that the relation between the environment, the economy and human well-being was much more complex. Nevertheless, the zero growth movement has been influential since then and has a diversified range of contemporary streams, such as the more European degrowth movement and the more American steady-state economy (Daly 1991, Demaria *et al* 2013).

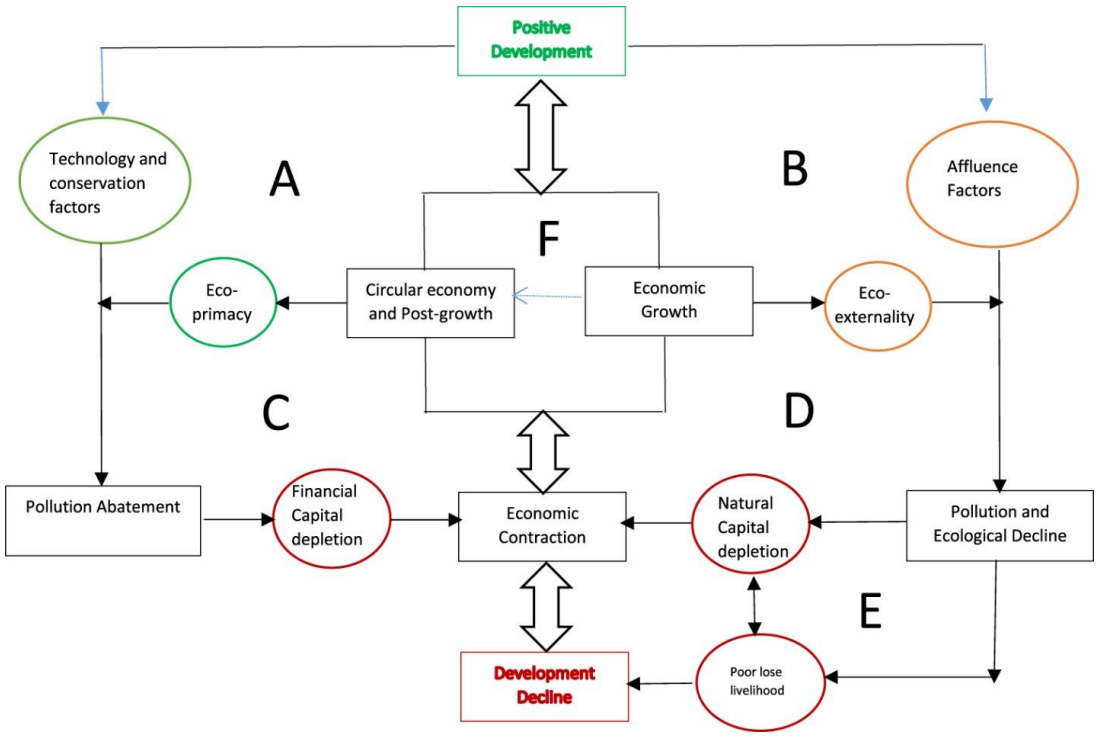

Figure 1. Schematic representation of feedbacks between pollution, economic growth and development which will be covered in this review with possible causal pathways which are further explicated in narrative.

Figure 1 attempts to distill some of these connections and this literature review will focus on five of the fundamental connections noted in this diagram in pathways, A, B, C, D and E with clarification on some of the other feedback loops and connections also noted. This figure is meant to reflect the various debates and controversies in the field as represented by possible causal pathways and is not meant to be an exhaustive or deterministic diagram of all possible causal mechanisms. Some of the most common intervening variables that can lead us towards one or another pathway are presented and will be further explicated in the accompanying text. The extreme nodes of the vertical development axis of the diagram is meant to reflect an established and accepted spectrum of development goals. Economic growth is clearly the dominant pathway towards reaching the positive goals of development but alternative approaches are also considered in terms of ecological constraints that could take us via a circular economy or post-growth model of development which will be discussed towards the end of this review as a possible opportunity for 'win–win' outcomes. This diagram is meant to show a range of possible paths and impact categories as a heuristic exercise rather than a deterministic model.

The term 'eco-primacy' reflects the assumption which proponents of that pathway make regarding environmental issues requiring priority because of long-term reliance of economic systems on the environment (Daly 2014). The role of technology in providing a positive development outcome along this pathway is an essential part of the literature that also connects economics with engineering and operations research (National Academy of Engineering 1991). In contrast 'eco-externality' refers to the dominant approach in neoclassical economics wherein environmental impact is perceived as exogenous to economic performance of firms and consumers and presents a more short-term approach to considering pollution (Oats 2006, Stavins 2012). Increased consumption, or 'affluence factors', is indicative of what comes forth as a natural outcome of development processes in most cases up to a certain point (Myers and Kent 2004). However, it is important to recognize that there is huge variation between countries regarding how this affluence effect leads to pollution. Japan, Germany and the United States are the most compelling examples of divergence in pollution impact and resource use intensity despite comparable economic development indicators (Schreurs 2003). The economic contraction is contending with the trade-offs between financial and natural capital depletion, which is investigated in further detail from the perspective of interdependence of livelihood generation on both forms of capital in the contemporary context of market economies. Let us now consider each of these key areas of interactions between the economy and the environment in terms of evidence-based research that can inform policy formulation.

This paper attempts to distill some of these environment-economy connections (labeled in figure and provide new analysis from the recurring discussions on the links between environmental protection and economic development, and their implications for human well-being. It will focus on six of the fundamental connections (A, B, C, D, E and F) that have permeated the environment-development debate as follows:

(A) Economic development outcomes leading to pollution abatement (EKC hypothesis).

(B)Economic development increasing pollution.

(C) Pollution abatement's negative impact on economic growth.

(D)Pollution's negative impact on economic growth.

(E)Pollution's negative impact on development (even with economic growth—inequality effect).

(F)Circular Economy as a way forward?

Fundamental Pollution Drivers in a given society

Following figure shows major drivers of pollution which are Industrialization, Globalization and Population growth or Urbanization. All of above play role in pollution level increase in form of air, water, land and noise.

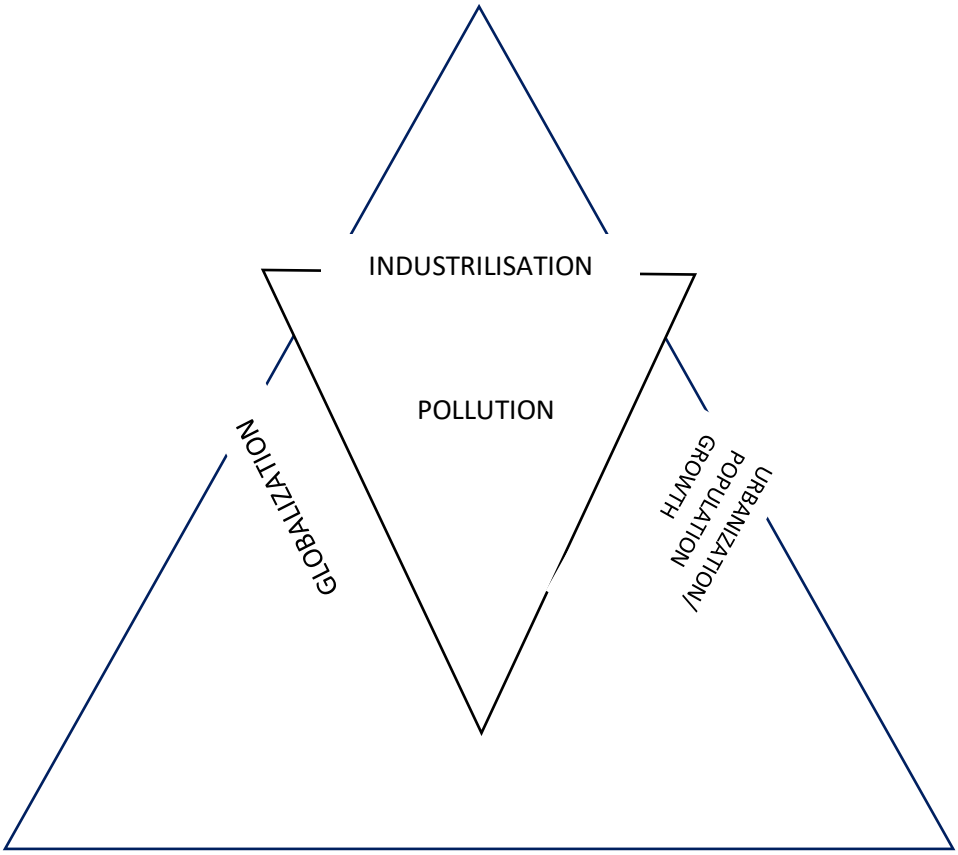

Figure 2 : Population triangle with tragic parameters

Industrialization: In industrialization the widespread use of fossil fuels (oil, gas and coal) which are the main sources of pollution. Industrialization process also emitting waste gases like carbon monoxide, Sulphur oxides and nitrogen oxides which are the major waste product of industries. Industries pollutes air, land, and water in various ways that harm society deeply and long term. Sometime industrial products, packing are also sources of pollution.

Urbanization or Population growth is the second fundamental cause of pollution. As population numbers explode, the demand for food and other goods rises. This demand is met by an increased production and use of natural resources which in turn results in a higher level of pollution. On the other hand, consumption of these produced goods are higher which in turn is associated with higher waste generation. Globalization is another cause of pollution which has become an effective facilitator of environmental degradation (Nazeer *et al.*, 2016). Hence industrialization, population growth and globalization are the roots of the gigantic

pollution tree and serves as an obstacle to sustainable development. The sources of pollution include:

PRODUCTION

This is termed the primary cause of pollution, as it involves the whole process of extracting and processing natural resources and then manufacturing and selling processed goods. Manufacturing industries, power generation, road, rail and air transport and agriculture and timber production are the major pollution production sectors

CONSUPTION: This refers to residential, commercial and social sectors which utilize the goods offered by the production side.

Hence any industry belonging to either production or consumption plays its part in polluting the environment (Nazeer *et al.*, 2016). Karataş (2016) states that environmental problems such as Pollution, mostly arise from human activities. Environmental Pollution is mainly divided into three components, air pollution, noise pollution and water pollution:

AIR POLLUTION is primarily a by-product of energy consumption: Impurities in fuels lead to emission of Sulphur dioxide and particulate matter, Troposphere ozone results chemically from high concentration of nitrogen oxides (from fuel combustion) and organic vapours (from paint dying and gasoline evaporation, among other things), in the presence of sunshine. Air pollutants can lead to health problems, damages materials (such a buildings), deforestation causing low tree food production and increases the cost of maintenance (such as increased cleaning requirements).

WATER gets contaminated either from point or non-point sources. Point sources are direct sources of water pollution that can be controlled such as factories, sewage system, power plants and oil wells. While non-point sources are indirect from various pollution sources that are difficult to control such as rain that moves through the ground picking up pollutants, agricultural runoff of fertilizers from farm animals and crop land, air pollutants getting washed or deposited to earth, etc. all of which eventually enter into major water sources. Water pollutants affect groundwater which is the source of drinking water for many people. Groundwater

contamination primarily occurs from leaking storage facilities on the surface, waste storage or storage of bulk liquids and the leaching of pesticides and fertilizers. Increasing water pollution leads to loss of marine output and species.

NOISE pollution mainly produced from mechanization of human life including indoor machineries to outdoor traffic (Nazeer *et al.*, 2016).

Each of the following sections examine those connections between the environment and economic development based on the literature.

Objectives of Study

This research for following objectives

1) To study which factors are responsible for environmental pollution
2) To study future status of air, water and land
3) Industrial efforts are enough to protect environment
4) To study environmental degradation and role of industries
5) Suggest how to solve the problem related to environment pollution

Data Analysis

Grossly polluting industries more than doubled in 8 years: SOE in Figures

11% of these industries continue to flout pollution control standards in the country; nearly half of these are in Uttar Pradesh

In India, both surface and groundwater resources are under stress. One of the reasons for this is the substantial increase in the number of grossly polluting industries (GPI) between 2011 and 2018. There has been a 136 per cent increase in the number of grossly polluting industries over the period, according to the State of India's Environment (SoE) In Figures, 2019.

Around 84 per cent of the GPIs were found to be located in four states — Uttar Pradesh (1,079), Haryana (638), Andhra Pradesh (193) and Gujarat (178). GPIs are industries that discharge more than 1,00,000 litres of wastewater and/or hazardous chemicals into the rivers, and include pulp and paper mills, distilleries, sugar mills, textile units, tanneries, thermal power plants, the food, dairy and beverage industries, chemical units, slaughterhouses, etc.

Industrial Air Pollution – What's There to Hide

Perhaps never before has so much time been devoted in the Supreme Court and Parliament to air pollution as there has been since the start of the great smog of Delhi in October-November, 2019. Outside the two institutions, there have been headlines, protests, and campaigns.

News reporting, which shows the daily percentage share of farm fires in Delhi's pollution, has focused a lot of the attention to Punjab, Haryana and western Uttar Pradesh north of the capital. This percentage has fluctuated daily from 2-3% to a peak of almost 50%. But this in-your-face

pollution obscures a larger problem, that it's not only farm fires, it's not only Delhi, and it's not only in winter.

Satellite pictures repeatedly show smog hanging over the sub-continent, coast-to-coast, north to south[ii]. The haze over the landmass is similar to the haze over India's pollution policies. There are two main aspects to be covered in this paper. The first concerns the Critically Polluted Areas or CPA. The second is a vast network of emission monitors in polluting industries whose data the public cannot access. Both these are spread across India.

India's Critically Poor Areas

Way back in 2009, before air pollution became a 'thing' in public discourse, the government identified 43 Critically Polluted Areas. These were rated on a new index, the Comprehensive Environmental Pollution Index (CEPI) to cut pollution on priority. Apart from air pollution it factored in water and land pollutants and the effect on humans and eco-geological features. In almost ten years since then there's been little improvement, in fact as far as air pollution is concerned there's been a sharp deterioration.

The CEPI scorecard has been put out in public only four times since 2009. The most recent one was out as part of an order of the National Green Tribunal. This was the 2018 data released after a gap of five years. A comparison of the last two pollution scorecards with an emphasis on air pollution has perhaps one upside. The number of Critically Polluted Areas, those with a score of above 70, have come down from 43 to 38 in these nine years.

The rest of the pollution index data paints a dismal picture of deteriorating air quality.

- The overall number of Polluted Industrial Areas, of which CPAs are one part, has gone up from 88 to 100.
- All the top 15 CPAs in 2018, barring Manali in Tamil Nadu and Panipat in Haryana, were not in the top 15 in 2013.
- As many as seven in the 2018 list, including Mathura, Vadodara and Gurgaon, were not even listed as critically polluted five years earlier.

The scorecards label the status of pollution in the air, water and land as critical, severe and normal. This is calculated on the factors such as whether the number of people potentially affected within a 2 km boundary of the pollution source is above 100,000 or less.

- The number of the total Polluted Industrial Areas which had the status of 'critical' air pollution jumped fourfold from 8 to 32 in these five years, and those with 'severe' air pollution went from 17 to 28.
- Of the top 15 in 2013, only five places had 'critical' air, but this increased to thirteen places by 2018.

Table 1: Top 15 Critically Polluted Areas, 2018. Source: CPCB

Sl. No.	**Name of Polluted Industrial Areas (PIAs)**	**Air**	**CEPI 2018 Score**	**# Status of Environment**
1.	Tarapur(Maharashtra)	72.00	93.69	Ac*_Wc_Ls
2.	Najafgarh-Drain basin including Anand Parbat, Naraina, Okhla, Wazirpur (Delhi)	85.25	92.65	Ac_Wc_Ls
3.	Mathura (Uttar Pradesh)	86.00	91.10	Ac_Wc_Ln
4.	Kanpur (Uttar Pradesh)	66.00	89.46	Ac_Wc_Ln
5.	Vadodara (Gujarat)	82.00	89.09	Ac_Wc_Ln
6.	Moradabad (Uttar Pradesh)	76.00	87.80	Ac_Wc_Lc
7.	Varanasi-Mirzapur (Uttar Pradesh)	67.50	85.35	Ac_Wc_Ln
8.	Bulandsahar-Khurza (Uttar Pradesh)	79.50	85.23	Ac_Wc_Ln
9.	Gurgaon(Haryana)	70.00	85.15	Ac_Wc_Ln
10.	Manali (Tamil Nadu)	59.75	84.15	As**_Wc_Lc
11.	Panipat (Haryana)	66.00	83.54	Ac_Wc_Lc
12.	Firozabad (Uttar Pradesh)	76.00	81.62	Ac_Wc_Ln
13.	Udham Singh Nagar (Uttarakhand)	33.00	81.26	An_Wc_Ln
14.	Jodhpur (Rajasthan)	67.00	81.16	Ac_Wc_Lc
15.	Pali (Rajasthan)	66.00	80.48	Ac_Wc_Lc

*Ac: Air-Critical **As: Air-Severe

Table 2: Top 15 Critically Polluted Areas, 2013. Source: CPCB

2013 rank	Industrial Cluster / Area	State	Air	CEPI 2013 score	Status of Environment
1	Vapi	Gujarat	51.75	85.31	As-Wc-Ls
2	Ghaziabad	Uttar Pradesh	69.5	84.13	Ac-Wc-Ln
3	Vatva	Gujarat	43	83.44	An-Wc-Ln
4	Singrauli	Uttar Pradesh	68	83.24	Ac-Wc-Lc
5	Pali	Rajasthan	54	82.71	As-Wc-Lc
6	Chandrapur	Maharashtra	51.75	81.9	As-Ws-Lc
7	Panipat	Haryana	48.25	81.27	An-Wc-Ln
8	Ankaleshwar	Gujarat	67.5	80.93	Ac-Wc-Ls
9	Vellore -North Arcot	Tamil Nadu	59.75	79.67	As-Wc-Ln
10	Indore	Madhya Pradesh	65	78.75	Ac-Wc-Ln
11	Noida	Uttar Pradesh	50	78.69	As-Wc-Ln
12	Jodhpur	Rajasthan	57.5	78	As-Ws-Lc
13	Mandi Gobindgarh	Punjab	55	77.98	As-Wc-Lc
14	Manali	Tamil Nadu	55.5	77.26	As-Wc-Ln
15	Patancheru Bollaram	Andhra Pradesh	62.5	76.05	Ac-Wc-Ln

Hidden in plain view: Nothing transparent about air pollution data?

In 2016, CEPI was revised essentially to ease the moratorium on environmental clearances to allow for changes to capacity, manufacturing processes and so on as long as there was no increase in the pollution load or any adverse impact on the environment. It also called for polluting sources to be identified in the public domain and published by state governments periodically.

Trawling through pages and pages of websites, there is clearly a need for clear, simple reporting of how pollution is being monitored and controlled and if polluters are indeed paying up.

Take for example the case of thermal power plants in Haryana. As per Haryana's rules till very recently mandated inspections once every three years. But the Bahadurgarh one was last inspected in July, 2013, the Ballabhgarh one in November 2014, and the Panipat

one in December 2015[9]. This pace of inspections of these thermal power plants is obviously not enough, a fact recognized by the NGT and given these are 'red' category industries, that is, highly polluting.

A letter by the chairman of the Haryana State Pollution Control Board from 10th Oct, 2019, says the NGT found that the board's inspection policy hardly matched the mandate of precautionary sustainable development principles of environmental law. Also, its auto-renewal policy results in pollution remaining unchecked. On being ordered to revise its inspection schedule, the board has now announced inspection once a year for power plants. But on its website, there's been no update of whether these have been inspected. This, when all these power plants are in the pollution air shed of Delhi and its neighbours and contribute in making it the region with the world's worst levels of air pollution.

But contribute exactly how much? This is data that is kept out of the public domain. All polluting industries are required to have, since 2016, Online Continuous Emissions Monitoring Systems (OCEMS). As of 2019, there are over 2700 OCEMS installed in a little over 3500 "highly polluting" industries[10]; the remaining faced closure-directions according to the National Clean Air Programme. The OCEMS data goes directly to CPCB. But the CPCB does not release this publicly. Its officials have the power to take immediate corrective action against industries in order to control pollution. India's environment minister told the Rajya Sabha that they are "controlling every minute" of the OCEMS.

But there appears to be a contradiction between what officials say. This system of minute-to-minute monitoring of pollution on which officials can take immediate action against businesses cannot be used for regulatory purposes. As the CPCB chairman, SPS Parihar, said at a press conference on the 18th of November, 2019, the online data is yet to be recognized under the law and that's work in progress. While there is an online and continuous monitoring system, the law mandates only manual data, which is slow to process, be used for regulatory purposes and field visits are made on this basis.

There is a case study worth looking at briefly about Panipat's Indian Oil refinery. It's about how a polluter, as recognized by the NGT, put up a fight despite the work of HSPCB and CPCB officials which was praised by the tribunal.

The Panipat refinery is in the 'red' category of the 17 most polluting types of industry (the others being cement, thermal power plants and so on), and it was inspected by Haryana pollution control officials in June, 2018. It found the level of PM 10 pollutant far higher than the permissible limit of 100 micrograms per cubic meter. The officials reported irritation to eyes and an odour in the vicinity of the unit.

IOC in its defence before the NGT submitted that ambient air quality is an issue all over northern India and cannot be attributable to its refinery, something it claimed that the pollution control officials could also not prove. Nevertheless, IOC promised the Haryana State Pollution Control Board that it would reduce its carbon footprint by 18% by 2020. However, the tribunal ruled that the refinery must pay an interim compensation of Rs 17.31 crores. The NGT's reasoning was that there was a violation of environmental norms for air and water pollution, that liability was unavoidable and as a public sector unit the refinery should be a model for compliance with environmental laws.

Much of this points to a need for a clearer, more transparent data and regulatory regime. And perhaps also an overhaul in mindset – to recognize a problem and address it openly with no half-measures, which is what India's air pollution crisis demands.

Research outcomes

1) It is proved by various data growth of industries results into increasing environmental pollution
2) Environmental pollution in all forms by the industries it may be air, water, land, noise etc.
3) In future, it provides clear indication that growth rate of pollution gets more and more speed than industrial growth rate and finally pollution wash out all the growth.
4) Environmental pollution affects all the basic elements of natural environments and areas of the country
5) In future environmental degradation will create health disaster

Recommendations

For environment problems all stake holders must be aware and in action mode, otherwise we will reach at point of no-return. People awareness, government efforts and industrial accountability toward environment will save us. Responsibility must be

identified, quantified and assigned to the unit/person/government who is responsible for the same.

Conclusion:

For existence of livelihood all have to take matter of environment seriously. Otherwise there must be disaster in future and we can't sustain in polluted environment.

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