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RESEARCH ARTICLE

AN ECONOMIC RELATIONSHIP BETWEEN AIR QUALITY AND GDP OF INDIA WITH SPECIAL REFERENCE TO EKC

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ABSTRACT

Over years, changes in government policies like privatization, liberalisation and globalization has given a boost and opportunity to economy to work freely. As an outcome, economy twitches growing at faster speed. But these reforms had created a tremendous pressure on environment resources like forest, land, water and air. These vicissitudes have made the arcade too competitive that nobody has time to think about the public properties such as environment. In recent decades, undesirable environment changes such as global warming, Green House Gas (GHGs) emissions have raised worldwide concerns. In order to achieve higher growth rate, environmental problems emerged from economic activities have turned into a controversial issue. The worsening of environment instigates to have direct impact on the quality of human life. The aim of this study is to investigate an existence of any relationship between Foreign Direct Investment, Population Density and State Gross Domestic Product on Environmental degradation as hypothesised by Environmental Kuznets Curve (EKC). For this purpose, the Time Series data over the period (2010-2016) from the World Development Indicator has been taken. The paper clinches with some policy replications; the policy aimed at overall development should certainly include efforts to control carbon emissions and to improve environment quality. To sum up, there is an urgent need to control deleterious pollutants, conserve and protect natural resources and the environment for healthy human beings.

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INTRODUCTION

Over the last two decades changes in government policies like privatization, liberalization and globalization has given a new boost and opportunity to economy to work freely. But these reforms had created a tremendous pressure on environmental resources like forest, land, water, and air. Sometimes changes dominate too much that people often forget to think about environmental goods or say public goods that need to protected and consumed at a balanced manner. Being a public good, improvement in environment is the responsibility or the business of everybody but everybody thinks why me, which results in nobody. Sometimes tragedy of commons happen in the case such that everyone thinks other will protect the environment but in real nobody does. Increasing the trend of population, industrialisation, laissez faire economics, urbanisation and poverty are also some of the other factors responsible for environmental filth. India is battling to reduce the dangerous levels of pollutants which have seen a hike in India past few years.

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Once again India is heading into the foulest time of year for air pollution, a season where the country's notoriously poor quality becomes even more toxic. Soot, dust, ozone, and sulphur oxides are a growing threat for billions of people around the world. The World Health Organisation has reported this week that 93 per cent of all children in the world breathe that type ofpoisonous air with pollution levels that exceed their guidelines. India is committed to clean the environment and make India pollution free of air and water. In fact, it is mandated in our constitution. India's commitments and obligations to conservation and protection of environment within the ambit of targeted goals on environmental sustainability under the Sustainable Development Goals (SDGs)is manifested in the fact that several administrative and regulatory measures including a separate statute on air and water pollution are under implementation since long. "The Air (Prevention and Control of Pollution) Act, 1981, was enacted under Art. 253 of the Constitution to implement the decisions taken at the United Nations Conference on Human Environment held at Stockholm in June 1972", in which India also participatedas concerned member. India's development policy of human well-being is an integral philosophy of sustainable development without hindering the needs of future generation.

If we see the list of most polluted cities in world, we will get that the most cities which are in top belong to India. Air in metropolitan cities has become unbearable causing diseases with hazardous gases with unbearable accidents leads to highly pollute and pollutant concentrations exceeds limit considered unsafe by the World Health Organization (WHO). Suspended particulate levels in Delhi are many times higher than recommended by the World Health Organization (WHO) which is a serious cause of health issue. The urban air pollution has grown across India in the last decade are alarming. Some of the most important air pollutants are residual suspended particulate matter (RSPM), suspended particulate matter (SPM), nitrogen dioxides (NO2), carbon monoxide (CO), lead, sulphur dioxide (SO2) etc.

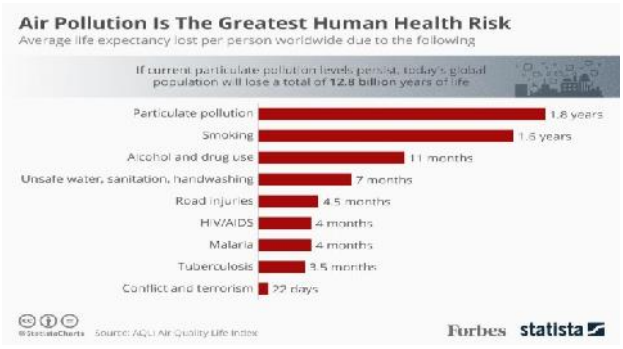


Fig.1.1. Causes of Air Pollution (Forbes Statistics)

Table1.1 AQI colour codes with Value (NAQI and CPCB)

Color Code	AQI Value	Actions to Protect Your Health
Green	Good (0-50)	None.
Yellow	Moderate (51-100)	Unusually sensitive people should reduce prolonged or heavy exertion outdoors.
Orange	Unhealthy for Sensitive Groups (101-150)	Sensitive groups should reduce prolonged or heavy exertion outdoors: People with heart and lung disease Children and older adults People that are active outdoors
Red	Unhealthy (151-200)	Sensitive groups should avoid prolonged or heavy exertion outdoors. Everyone should reduce prolonged or heavy exertion outdoors.
Purple	Very Unhealthy (201-300)	Sensitive groups should avoid all physical activity outdoors. Everyone should avoid prolonged or heavy exertion outdoors.

Sustainable Development is most common phrase used by the world economics. Sustainable Development means economic development with ecological sustainability. According to Brunt land commission 1987, "Sustainable development means meeting the needs of present generation without compromising the needs of future generation". Nonetheless if we see the genuineness every economy is concern about its GDP. GDP defines sum total of economic production of goods and services on the basis of transaction in the domestic market in a year.

Calculation of GDP ignores the cost of depleting the environment resources. Every economy wants to beats the other economy and wants to be at top. Not only economies but individuals are running after each other to attain higher ranking in competitive market, ignoring what damages they are causing to environment and its resources, which will indirectly affect their health. Failure of Kyoto protocol project is one example. This project fails because it imposes limit to the economic growth in reduce carbon emission.

Table 1.2. Major pollutants low to high value with health causes

Four bands of air quality:	Index (1-10):	Five air pollutants which can harm your health: Ozone Running 8-hour mean (µg/m³)	Nitrogen dioxide 1-hour mean (µg/m³)	Sulphur dioxide 1-hour mean (µg/m³)	$PM_{2.5}$ particles Running 24-hour mean (µg/m³)	PM_{10} particles Running 24-hour mean (µg/m³)
Good air quality	1	0-33	0-67	0-29	0-11	0-16
	2	34-65	68-134	30-59	12-23	17-33
	3	67-100	135-200	60-89	24-35	34-50
Fair air quality	4	101 120	201 267	90 119	36 41	51 58
	5	121-140	268-334	120-149	42-47	59-66
	6	141 160	335 400	150 179	48 53	67 75
Poor air quality	7	161-187	401-467	180-236	54-58	76-83
	8	188-213	468-534	237-295	59-64	84-91
	9	214-240	535-600	296-354	65-70	92-100
Very Poor air quality	10	241 or more	601 or more	355 or more	71 or more	101 or more

NATIONAL AIR QUALITY INDEX: On April 6, 2015, India had launched its first ever National Air Quality Index (NAQI) and acknowledged the problem of its incessantly rising air pollution. This index was launched by Prime Minister Narendra Modi in New Delhi, developed at IIT Kanpur starting with 10 cities in the first phase. The cities include Delhi, Agra, Kanpur, Faridabad, Lucknow, Varanasi, Ahmedabad, Chennai, Bangalore and Hyderabad. The NAQI was prepared by an expert group, set up under the Ministry of Environment and Forests, comprising of renowned medical practitioners from hospitals and research agencies. Presently NAQI has been extended to 57 cities in India. This AQI was developed through a sponsored study from Central Pollution Control Board, Delhi. The year 2019 marked the launch of National Clean Air Programme for 102 cities and towns including the capital. The IQ Air Visual 2018 World Air Quality Report published in collaboration with Greenpeace underscores that Delhi remains an extremely hazardous city to live in.

Air quality index is used for reporting day to day air quality with regard to human health and the environment. The daily results of the index are used to convey to the public an estimate of air pollution level. An increase in air quality index signifies increased air pollution and increasing threats to human health. In most cases, AQI indicates how clear or polluted the air in our surrounding is, and the associated health risks it might present. The AQI centers on the health effects that may be experienced within a few days or hours after breathing polluted air. The below table will describe how different colour codes have been given to different pollutants and with its hazardous health effect.

One must aware of its dire consequences with its direct or indirect contact. Its been divided into five colour codes with its value and its effect. On the basis of this bifurcation the health effects are furthered graded into particles weight. As we go down according to colour code, economists found that the country is moving more towards trade liberalisation and financial openness. Many economists kept the basis of EKC hypothesis for further validation. So it is clear from the table with pollutants colour code and its value. Green colour has its none consequences but as colour goes to yellow then orange and ends at purple which shows the increasing in the level of air pollution in one region or country. The past era has seen all drifts of environmental degradation accelerate such as greenhouse gas emissions, deforestation, loss of biodiversity.

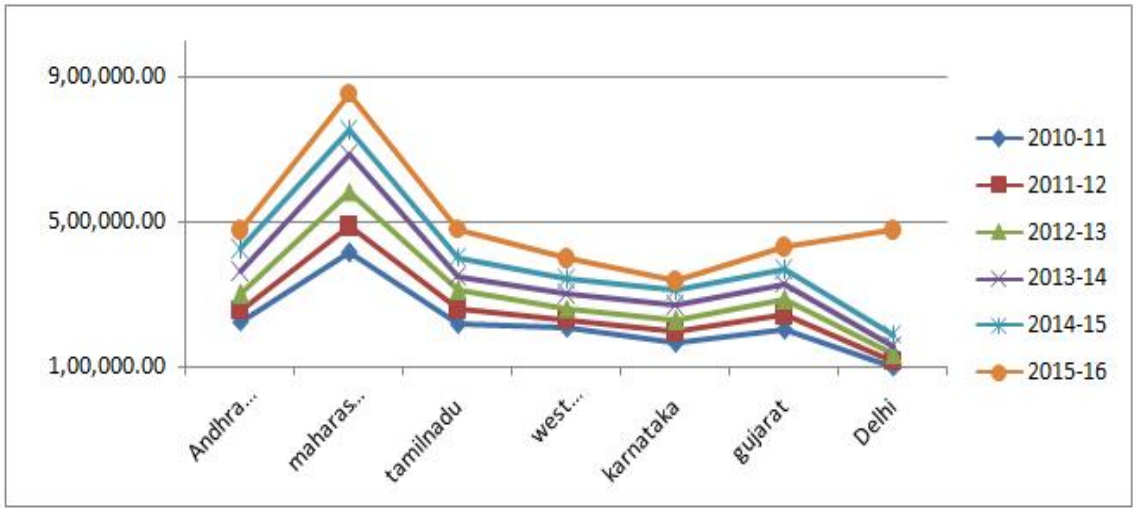


Figure 3.1. Trend of State Gross Domestic Product of 7 states (2010-16)

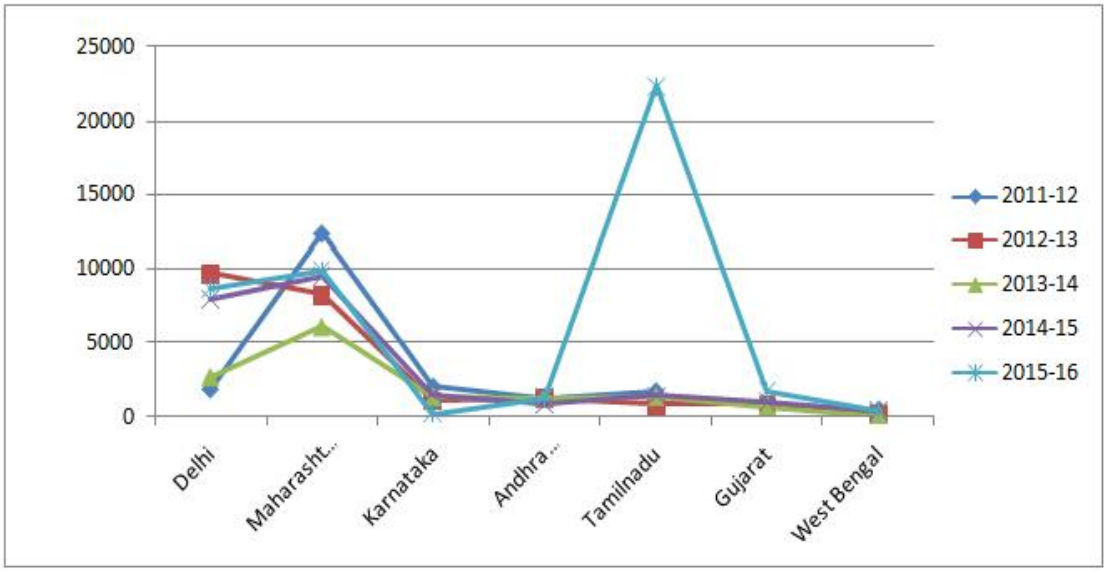


Figure 3.2. Trend of FDI in industries causing environmental pollution (Metallurgy industries, Construction industries)

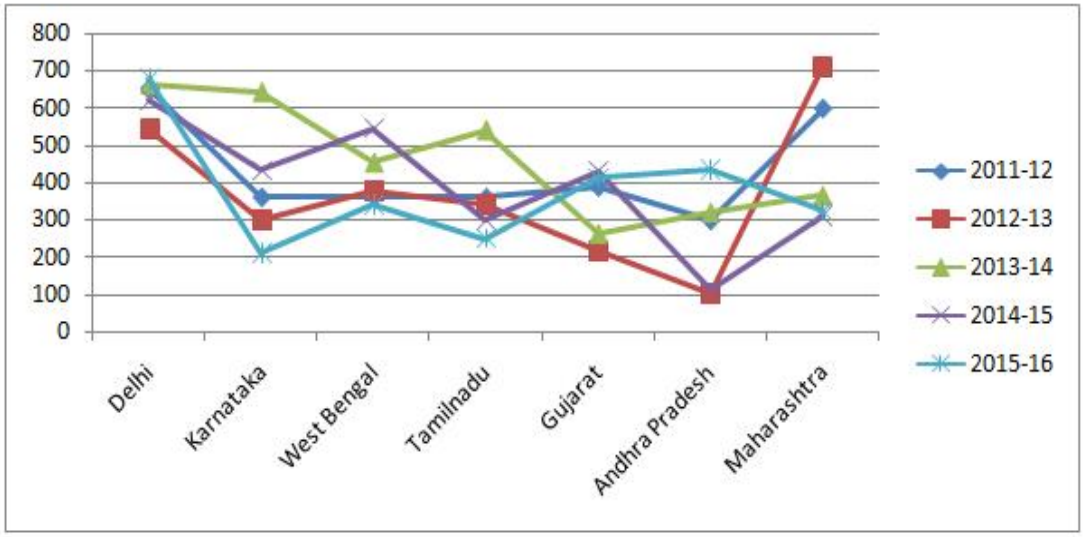


Figure 3.3. Trend of Major air pollutants in Major Polluted Indian Cities

Table 3.1. SGDP (2010-16) in crores of major Indian states

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Delhi	100,325	115,374	135,584	157,947	189,533	219,753
Maharashtra	415480	486766	584498	684817	753969	855751
Tamilnadu	219003	257833	310526	350819	401336	479733
West Bengal	208656	230245	261682	299483	341942	398880
Karnataka	166747	195904	227237	270629	310312	337559
Gujarat	203373	244736	283693	329285	367912	431262
Andhra Pradesh	2248713	255941	301035	364813	426765	476835

Source: CSO, RBI statistics, India

Table 3.2 FDI data from (2011-16) in crores

STATES	2011-12	2012-13	2013-14	2014-15	2015-16
Delhi	1868	9695	2677	7983	8675
Maharashtra	12431	8249	6097	9553	9934
Karnataka	2026	1029	1332	1533	226
Andhra Pradesh	1238	1203	1262	848	1340
Tamilnadu	1724	774	1352	1422	22354
Gujarat	2826	807	724	1001	1744
West Bengal	489	115	95	394	418

Source: Reserve Bank of India, MOSPI

Table 1. Descriptive Statistics for the Year 2011

	EPI	GDPPCPPP	GNIPCPPP	PD	GCFFDI	GED
Mean	58.4	17943.9	16735.9	0.7	23.6	0.4
Median	59.2	10546.5	10206.9	0.7	21.5	0.4
Maximum	93.5	127235.7	71380.7	0.9	71.4	0.7
Minimum	32.1	725.3	720.8	0.3	9.3	0.0
Std. Dev	12.4	21104.8	16430.1	.2	9.2	0.2
Skewness	0.1	2.2	1.3	-0.4	1.9	-0.1
Kurtosis	2.5	9.5	3.9	2.0	8.8	1.8
Jarque-Bera	1.7	358.6	31.1	9.5	272.0	7.7
Probability	0.4	0.0	0.0	0.0	0.0	0.0
Observations	163	142	104	149.0	134	125

Table 2. Descriptive Statistics for the Year 2016

	EPI	GDPPCPPP	GNIPCPPP	PD	GCFFDI	GED
Mean	50.7	16919.9	19241.6	0.7	23.9	0.4
Median	50.1	10739.0	13709.9	0.7	21.9	0.4
Maximum	87.7	127562.2	74444.0	0.9	71.4	0.7
Minimum	18.4	584.4	1009.0	0.3	9.3	.0
Std. Dev	16.7	19196.2	15948.1	0.2	9.1	0.2
Skewness	0.2	2.3	1.2	-0.4	1.9	-0.2
Kurtosis	2.2	11.0	4.2	2.1	9.0	1.8
Jarque-Bera	4.7	507.2	19.4	8.1	271.8	7.4
Probability	0.1	0.0	0.0	0.0	0.0	0.0
Observations	143	143	64	140	129	115

Table 3. Correlation Matrix for the Year 2011

	LOG(EPI)	LOG(GDPPC)	LOG(GNIPC)	LOG(FDI)	LOG(PD)	LOG(GED)
LOG(EPI)	1.00	0.69	0.70	-0.27	0.74	-0.62
LOG(GDPPC)	0.69	1.00	1.00	-0.22	0.95	-0.79
LOG(GNIPC)	0.70	1.00	1.00	-0.22	0.96	-0.79
LOG(FDI)	-0.27	-0.22	-0.22	1.00	-0.23	0.21
LOG(PD)	0.74	0.95	0.96	-0.23	1.00	-0.76
LOG(GED)	-0.62	-0.79	-0.79	0.21	-0.76	1.00

Table 4. Correlation Matrix for the Year 2016

	LOG(EPI)	LOG(GDPPC)	LOG(GNIPC)	LOG(GFCFDI)	LOG(PD)	LOG(GED)
LOG(EPI)	1.00	0.90	0.90	-0.21	0.91	-0.81
LOG(GDPPC)	0.90	1.00	1.00	-0.16	0.97	-0.81
LOG(GNIPC)	0.90	1.00	1.00	-0.16	0.96	-0.81
LOG(GFFDI)	-0.21	-0.16	-0.16	1.00	-0.16	0.21
LOG(PD)	0.91	0.97	0.96	-0.16	1.00	-0.80
LOG(GED)	-0.81	-0.81	-0.81	0.21	-0.80	1.00

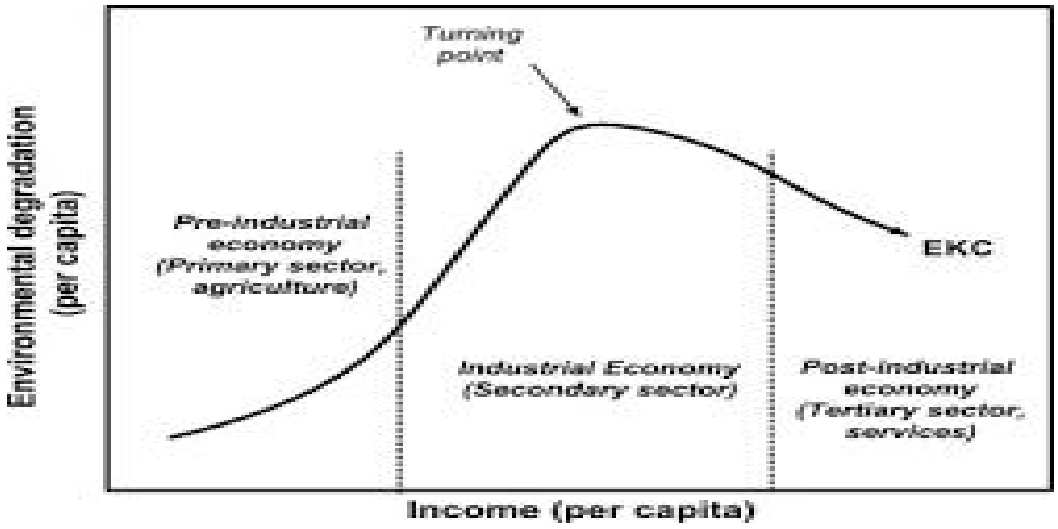
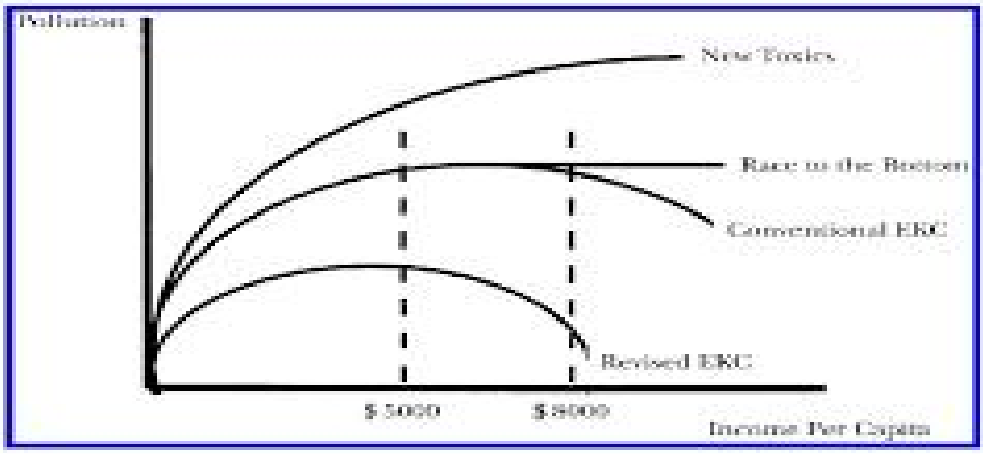
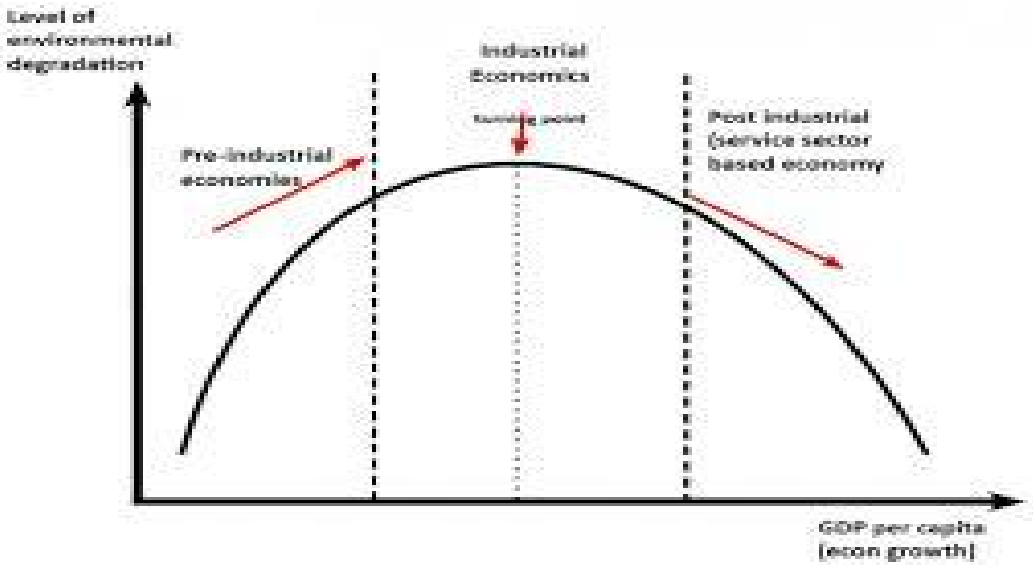


Figure 1

Environmental Kuznets Curve: Different Scenarios





Such outlines of environmental annihilation have been driven by increased economic activity, of which FDI has become an increasingly significant contributor. Flows of natural resource based commodities and investment are predicted to rise faster than economic output in future.

It is therefore critical to understand the environmental effects of private investment and identify appropriate responses (Nick and Richard, 1999).The Indian economy has attaining continuous growth in the past mostly due to its success in raising international trade which now accounts for approximately 200% of Gross Domestic Product (GDP).

The inflow of substantial foreign direct investment (FDI) and a robust capital market are the key elements that supported India's economic growth. India emerged the most attractive investment destination in the world for the next three years, may lead to an increase FDI inflows in computer software and hardware, trading, service, automobile and telecommunication sectors. Similarly India plan to cut carbon emissions by 33 to 35 percent from 2005 base levels by 2030 through the adoption of about 40 percent electric power installed capacity from non-fossil fuel based energy resources by 2030 with help of transfer of technology and low cost international finance and also by Creating an additional carbon sink of 2.5 to 3 billion tones of CO2 equivalent through additional forest and tree by 2030. India is third emitter of CO2 in the world followed by China and USA. This paper is aimed at investigating the two most important benefits and costs of foreign direct investment in the Indian context that is GDP growth and the environmental degradation. The non-linear model examines the relationship between GDP per capita and environmental degradation during 2010 to 2016.

Environmental kuznet curve: Environmental Kuznet Curve (1955) showed the mathematical inverted U relationship between income inequality and economic growth. In other words as economic growth increases at the cost of environmental degradation resources are exploited and in this case the nature's assimilation capacity gets reduced. Furthermore, the Environment kuznets curve is an inverted 'U' shaped curve which describes the commonly observed relationship between an environmental pollutants and per capita income. It is often used to express the relationship between economic growth and the environmental quality. The EKC hypothesis closely relates the aspect of "Limits to Growth" and the concept of 'Sustainable Development'. The shape of the curve shows that as GDP per capita rises at initial stages of economic growth of a country, the environmental quality degrades. However beyond a certain point, increases in GDP per capita lead to reduction in environmental damage.

Panayotov (1993) suggests that at later stage of development, if structural changes in economy towards information-intensive industries and services are coupled with some social, legal, fiscal and technical advancement like increased environmental awareness, enforcement of environmental regulation, higher environmental expenditures and inventions of environmental- friendly technology, then it results in gradual decline in environmental degradation. It is generally argued by economists that economic growth is a prerequisite for necessary development of an economy and society. It has been argued and supported by empirical evidence that high economic growth has benefitted a large section of poor people by raising their standards of living and improving their quality of life across various regions globally. Along with, researchers also raised the point that the unconstrained effort to raise economic growth across global have resulted in the depletion of natural resources and the degradation of environment to a large extent. This raises doubt about sustainability of economic growth and maintaining environmental quality. According to the known history of industrial economies, higher rate of economic growth in most of the economies has been achieved by using capital and energy intensive technology and environment unfriendly development strategies. It is no more a hidden fact that growth led paradigm based on high energy and capital intensive production activities has generated larger quantity of by- products causing pollution, depletion and degradation of environmental quality as a result of increased of increased extraction of natural resources, accumulation of waste and release of pollutants. It is broadly agreed that the pursuit for high economic growth has caused environment degradation but there are also some evidences indicating that higher economic growth will create fastest road to environmental improvement along the path of economic growth. It is presumed that higher incomes generate demand for environmentally friendly goods and services leading to adoption of environmentally friendly technologies and adoption of environmental protection measures. Resources accumulated through economic growth will facilitate environmental friendly innovations and technological development which enhances productivity of natural resources and reduces the rates of environmental degradation and resource depletion. It implies that growth creates its own environmental sustainability. Many scholars have attempted to model the pollution income relationship and generated smooth inverse U shaped pollution- income path. Some have even observed multiple changes of direction ad introduced N shaped of EKC. In this perspective, this paper is an attempt to re-examine the interaction of growth and environment econometrically in cross- section framework.

Review of selected literature: Grossman and Krugmar(1995) established an income pollution relationship stating as resources increase usage also increases leads to waste generation. So it establishes a relationship of inverted U between economic growth and environmental degradation.
Tamazian et.al (2010) examined the effect of financial development in the BRICS countries. He found that there is a direct relationship between financial development and economic growth on environmental pollution. He has further justified that financial liberalisation and openness will help to reduce environmental pollution which will enhance Research and Development in the field of trade policies. Together R&D and FDI may reduce environmental pollution in these countries.

Zhang (2012) examined the effect of FDI in CO_2 emissions in China during the period of 1994 to 2010.China's capital market is much bigger than financial intermediaries which have a meagre effect on environmental standards. Ozturk and Acaravci (2013) examined the effect of energy consumption, trade, financial development and economic growth on carbon emissions. The only flaw is that the variable financial development is not suited otherwise EKC is perfectly existed.
Fotros and Maboodi(2013) investigating the existence of causality and direction using the econometric approach of Yamamato among CO_2 emissions, urbanisation, economic growth and energy consumption from the period of 1980-2009 years. Results verified the bilateral causal relationship between variables of CO_2 emissions and per capita energy consumption and unidirectional causal relationship from GDP to per capita energy consumption. Barqui and Farooqui (2015) estimated the impact of variables such as energy consumption, factory products, FDI, economic openness on carbon dioxide emissions from the time period of 1990-2010 years. Long run dynamic relationship has been proved and causality has been established. Barqui and Farooqui (2015), 'Impact of energy consumption, factory products, FDI, economic openness on carbon dioxide emissions from the time period of 1990-2010 years'; International Journal of Francis and Taylor; ISSN:2346-8956.

STUDY AREA

Testing the validation of EKC hypothesis in 7 states of India i.e., Delhi, Karnataka, Tamilnadu, West Bengal, Andhra Pradesh, Gujarat and Maharashtra. Three regressors are population density, FDI and GDP on Environmental degradation. Time periods of five financial years (2011-16) have been taken.

DATA AND RESEARCH METHODOLOGY

Gross state domestic product data of 7 states Delhi, Karnataka, Tamilnadu, West Bengal, Andhra Pradesh, Gujarat and Maharashtra has been taken from National Account Statistics, CSO, India. Environmental degradation data is a summation of 6 air pollutants (CO_2, SO_2, O_2, NO_2, PM_{10} and $PM_{2.5}$) collected from CPCB by assigning different weights to it. Foreign Direct Investment of construction development, metallurgy industries and automobile industries data of composition effect have been taken from Department of Industrial policy and Promotion in particular and RBI in general.

Data collection and analysis: The present study made an attempt to estimate the relationship of environment performance and economic growth. Data o GDP per capita, PPP (constant 2011 international $), GI per capita, PPP (constant 2011international $), Gross Fixed Capital Formation has been drawn from World Bank's World Development indicators,2016. The data pertaining to environmental performance index is ajoinnt project between the Yale centre for Environmental Law and Policy (YCELP) and the centre for International earth Science Information Network (CIESIN) ai Columbia UNniversity inn collaboration with the Samuel Family Foundation and the World Economic forum. EPI is contructed by using various indicators capturing environmental health and ecosystens vitality. Each of the categories in turn consist of a number of sub categories, such as air quality, water resources, biodiversity and habitat, natural resources, climate and energy.

The index is based on the proximity to target methodology, which is focused on a set of environmental outcomes linked to policy goals. By formulating specific targets and measuring how close each country comes to them, the EPI provides a basis for policy analysis and for evaluating environmental performance and also facilitates cross country comparisons. The data on human development index and Gender Inequality Index is taken from human development reports of various years, published by UNDP annually. To achieve the objective of the paper, correlation technique have been applied. The correlation coefficient between any two variables (ρ_{xy}) is defined as follows:

$$\rho_{xy} = \frac{C\ (x,y)}{\sigma\ .\sigma} = \text{Cov}\,(X,Y) = \rho_{xy}.\sigma x.\sigma y$$

The below figure shows the trend of state gross domestic product in major Indian states namely Maharashtra, Delhi, Andhra Pradesh, West Bengal, Gujarat, Karnataka and Tamilnadu from past five years. The table 3.1 clearly depicts that the larger the geographical size the more the Gross Domestic Product. We can see a more peak in Maharashtra's GDP in all years whereas sudden waves are breakdown in the states of Gujarat, West Bengal and Karnataka. Reasons can be otherwise too.

The above graph shows the fluctuations in FDI inflows to different Indian states. The data FDI includes specially the industries whose inflows somewhere affect the environment. The first objective of Pollution Haven Hypothesis (PHH) into a bi-regional input output framework to analyse whether the specialisation of these Indian states is clearly shown by above graph. It posits that when large industrialised cities seek to set up factories or offices abroad they will often look for the cheapest option in terms of resources and labour that offers the land and material access they require. The above figure clearly depicts the violation of PM pollutants targets. A decreasing trend has been observed in the states of West Bengal and Andhra Pradesh but that also seen a hike in one year. Delhi nonetheless on the top at all years. Local governments of various states also implemented stricter policies.

EMPIRICAL RESULTS

Descriptive Statistics (DS) are calculated to illustrate the basic features of data used in this paper. DS are estimated for two periods: 2011 ad 2016 as show in Table1 and 2. The mean value of EPI score is 12.4 and 16.7 for the year 2011 and 1014 respectively. Though sample size varies, it gives reasonable idea of decreasing environmental performance and increasing inequalities in the level of environmental quality over time. The mean per capita GDP in purchasing power parity terms is US$ 17943.9 and US$ 16919.9 for the year 2011 1md 2016 respectively. The mean value of human development measured by PD and GED is 0.7 and 0.4 respectively. For both years, gross capital formation remains at 23.6% of GDP. The most interesting feature is the Kurtosis which measures the magnitude of extremes. If a variable is normally distributed, then the kurtosis should be three. It is found to be very high except for EPI score. Jarque Berra statistics also suggest that all variable series except EPI are not normally distributed. It is clear from the above table those mean and median values of PD and GCFFDI is 0.7, 0.7 and 23.6, 21.5 which shows the normally distributed data. The probability value except EPI i.e., Environmental performance Index all other variables come to 0. This above table clearly depicts the descriptive statistics for the year 2016. Compared to above one table 2 mean and median values does not deviate. The probability values is more common except EPI which in table 2 also shown. Skewness value came negative for the variables PD and GED.

CORRELATION COEFFICIENT

Correlation coefficient measure the strength of association between two variables. The score has strong positive linear relationship with per capita GDP, with per capita GNI and with HDI. Result further reveals that Gender Inequality Index and gross capital formation as percentage of GDP is negatively associated with EPI scores. Table 4 shows correlation coefficient for the year 2016. Though the values vary but the direction of relations remain invariant. It is surprising fact to know that the domestic capital formation is also found to be negatively associated to the environment performance index. It seems that investment has not been scrutinised on environment safety parameters. The figures are as follows:

CONCLUDING REMARKS

The study has made an attempt to test the Environmental Performance Index.

In this study, the relationship between income and environmental quality has been examined to re test the EKC hypothesis. In addition to income per capita, gross capital formation, human development index and gender inequality index are also included while estimating the EKC hypothesis. Econometric models are estimated on cross section data for the year 2010 and 2016. This study contributes to the EKC literature by using not a separate but a composite indicator of environmental quality, represented by EPI score.

The results of this study accepts an inverted U shape of EKC hypothesis and rather it concludes predicted cubic or N shape of EKC. As this study based on EPI not on environment degradation index, Nshape of EKC is equivalent to inverted N shape of EPC in this paper. It implies an increase in GDP degrade the environment at initial stages, after attaining critical level of per capita, environment improves but again environment degrades. Results of this study also signify the role of higher level of human development and lower level of gender inequalities in the improvement of environmental quality. These results highlight the significance of policies promoting human development and reducing gender inequalities.

The study reveals that the capital formation is negatively related to the environment performance index. It seems that investment has not been scrutinised on environment parameters. Given the fragility of environment, it is necessary on the part of nations to take mandatory steps to improve the environment. Generally, environmental norms are compromised or twisted to facilitate MNCs or national big enterprises to promote investment. Environment regulations are relaxed on myopic notions on the name of creating Investment friendly environment. To protect global environment, there is a need to negotiate some basic global norms of environmental protection for international investment at multilateral forum. So far, all negotiations at multilateral level have become a blame game between developing and developed countries.

As the EPI index creators concede themselves, the main limitation of the EPI is the lack of time-series data and the inability to track change in environmental performance over time. However, it still allows us to perform cross country analysis to explain overall environmental performance. Though, the present study has used some variables as control variable such as HDI, GII and GFCFGDP while examining EKC but the study does recognise the role of other variables.

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