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# The state of India's environment: reflecting its underdevelopment

*O meio ambiente na Índia: reflexos do seu  
subdesenvolvimento*

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## ABSTRACT

This essay takes stock of major environmental problems of contemporary India, and speculates on the relationship between economic (underdevelopment) and environmental outcomes. The continuation of the poverty and underdevelopment in the country seem to have shaped the nature of environmental problems that are faced by India. Open defecation and burning of biomass for cooking continue to be major sources of pollution. On the other hand, India's economic growth is driven by service-sector, and hence industry-led pollution has not increased to a level that can be expected in a developing country which has witnessed an above 5 percent economic growth during the last three decades. The paper concludes with a relook at the possible relationship between human development and environment, and possible strategies which are needed for sustainable development.

**Keywords:** India; Environment; Underdevelopment; sustainable Development

## RESUMO

*Este ensaio apresenta um levantamento dos principais problemas ambientais da Índia contemporânea e especula sobre a relação entre a esfera econômica (subdesenvolvimento) e os resultados ambientais. A continuação da pobreza e do subdesenvolvimento no país parece ter moldado a natureza dos problemas ambientais que a Índia enfrenta. A defecação em locais inapropriados e a queima de biomassa para cozinhar continuam a ser as principais fontes de poluição. Por outro lado, o crescimento econômico da Índia vem sendo impulsionado pelo setor de serviços e, portanto, a poluição industrial não aumentou a um nível esperado por um país em desenvolvimento, que vem testemunhando um crescimento econômico acima de 5% durante as últimas três décadas. O artigo conclui com uma visão sobre a possível relação entre desenvolvimento humano, meio ambiente e possíveis estratégias necessárias para o desenvolvimento sustentável.*

**Palavras-chave:** Índia; Meio Ambiente; Subdesenvolvimento; desenvolvimento sustentável.

Indian economy or the country's GDP (gross domestic product) has been growing at or above 5-6 percent for nearly three decades from the late-eighties (Reference?). Despite this growth rate, the per-capita income of the country is comparable to that of Bolivia and lower than that of Paraguay<sup>1</sup>. The persistence of higher level of poverty and underdevelopment in India is noticeable. Nearly 22 percent of the population still lives in absolute and abject poverty. Only around 5 percent of the population in India can be called global middle class (Brandi and Buge, 2014). According to one estimate, nearly three-fourths of the population can be categorised as poor and vulnerable<sup>2</sup>.

Despite the slower growth of agriculture's output relative to other sectors in the country and its declining importance in the economy, around half of the working population finds their livelihood in farming and related activities (reference?). They encounter issues of vulnerability and distress very often and in a number of major states, human development indices (HDI) are yet to reach desirable levels. This makes India's HDI ranked in 131 out of 188 countries (in 2014), below Honduras, Guyana and Guatemala<sup>3</sup>. The infant mortality rates continue to be above 50 per 1000 in a few Indian states. The country has missed the target of certain important dimensions of the Millennium Development Goals (MDG) set by the United Nations, such as reducing the proportion of people who suffer from hunger and maternal mortality rate (reference?).

It may be interesting in this context to look at India's achievements and failures in terms of environmental protection and sustainable development. Following is a set of impressions<sup>4</sup> on the achievements and persisting failures of India, in terms of protecting the country's environment and natural resources and probable reasons for the state of affairs.

## **1 ACHIEVEMENTS**

### *DECELERATION OF FORESTS' DEGRADATION*

It seems that the degradation of remaining patches of natural forest has declined in India. The official data indicates that there is an increase in areas covered by forests in the country from 640819 km<sup>2</sup> in 1987 to 697898 km<sup>2</sup> in 2013<sup>5</sup>. However this increase is in terms of areas under the trees, and as noted by many environmental scientists and activists, all of this may not qualify to be called natural forests (Joshi et al, 2010). Despite this apprehension, my impression is that Forestry Departments in different states of the country are currently in a better position to reduce deforestation<sup>6</sup>. This is an achievement in terms of environmental protection.

What is behind this achievement? No doubt, the enhanced awareness on the importance of conserving forests within the government, especially among forestry officers, in the country as a whole, has contributed to it. However there could be other enabling factors. Most of the forests are owned by the government (a colonial legacy), while the Indian Forest Act of 1927 enables the government to declare any area to be a reserved forest (Reference). Then, the Wildlife Protection Act of 1972 has also empowered the state to declare any forest area as a protected territory (Reference). People who were traditionally using forests for their livelihood – the Scheduled Tribes<sup>7</sup> – did not have any legal right and they could be denied access or be removed out of forests. They are the least 'powerful'<sup>8</sup> section of Indian society and, hence, their needs, rights and demands could be neglected. Even when some of their rights are recognised under the so called Forest Rights Act, these are not implemented or enforced seriously<sup>9</sup>.

Hence, with the state ownership of forests (or a de-facto ownership of the forestry department), and the feeble power of a major actor (the tribal population), forestry officials could use a top-down approach to protect forests. The current tendency is to declare as many areas as wildlife sanctuaries (by keeping forest-dependent population as much out as possible) whether it is needed for the preservation of the targeted species or not. Though there are efforts to share some benefits of forest conservation to local communities (Mishra et al, 2009), their participation is not that notable in reality. Even though the protection of forests is desirable, it has been achieved by imposing a higher cost on a section of

Indian society. Hence, my argument is that the political economy driven by the powerlessness of a social group has enabled the protection of forests. In the next part of this essay, we may see other cases wherein the political economy driven by powerful sections, leading to failures in protecting other aspects of environment in the country.

### **SLOWER INCREASES IN INDUSTRIAL POLLUTION**

There is another 'achievement' in my view. Though India's economy has grown at above 5 percent for the last 30 years, one may not observe a comparable increase in industrial pollution in the country (Reference). I am comparing the current situation with the pollution that would have occurred in a developing country which experiences such an economic growth for such a long period. In that sense, India may be a little better than China<sup>10</sup>. The projected premature deaths due to air pollution between 2001-2020 in China is around 590000 per year whereas the corresponding figure in India is around 22 percent lower<sup>11</sup>. Moreover, the major contributor of that pollution in India is from the use of poor-quality cooking fuels in houses and not industries. On the other hand, burning coal in industrial production is the major source of industrial pollution in China. Hence poverty or underdevelopment is the main source of air-pollution in India whereas that in China is industrial development. What may have reduced the industrial pollution in India in a relative sense? Is it due to the better enforcement of environmental laws during the last 2-3 decades?

There is another answer to this question. India's economic growth has been driven by developments in service sector, and its performance in industrial sector (especially manufacturing) is not that commendable. For example, the long-run industrial growth rate of China (between 1950 -2000) is one and a half times higher than that of India (Nagaraj, 2005). This poorer performance in industrial or manufacturing sector is not due to environmental laws but due to a set of factors that work against India's competitiveness in this regard. In that sense, the unbalanced economic growth of India (with an overcrowded agriculture, stagnant industrial sector and a booming service sector) (Reference), which has negative implications for the employment, structural transformation of the economy, distribution of income and human development, may have moderated the growth of industrial pollution. Here too the (not so desirable) connection between under-development and environmental performance in India is evident.

One can see an influence of the political economy in the adoption and enforcement of policies aimed at environmental protection too. It has been relatively easy to impose a transition to compressed natural gas (CNG) as the fuel for transport vehicles in Delhi (Narain and Krupnick, 2007), but that may not be the case in other cities like Chennai or Kolkata. The nature of local economy, the constellation of powerful forces and their role in policy-making and implementation may explain this difference<sup>12</sup>.

There are also other areas which have experienced some improvement. The share of households using cleaner fuel for cooking has increased<sup>13</sup> and that may have reduced the indoor-pollution in their houses. There is an increase in investments for public transportation (like metro-rails in different cities). Though these may not have led to a significant reduction in urban pollution and congestion, these are important steps in the right direction. The resources available with the central and state governments as part of the economic growth may have enabled these investments.

## **2 PERSISTING FAILURES**

Though many environmental activists may not see it as an issue, I see the continuation of open defecation as a major environmental problem confronting India<sup>14</sup>. Nearly half of the population was defecating in open areas in 2011<sup>15</sup> (Though there is a greater focus on this issue by the government recently, reliable data on the achievements so far is not available). Open defecation has direct impacts: water pollution, water-borne diseases, worm-infestation and the consequent reduction in nutrient absorption, persistence of malnourishment, and the impacts on cognitive development and learning achievements of children. It is known that poverty is not the main reason for the continuing practice of open defecation in India (Spears and Coffey, 2017).

Though there are sections of Indian society who use toilets, there is not enough sewage treatment in the country<sup>16</sup>. The majority of toilets which are used in India keeps the sewage in-situ (in pits). In 2011, only 11.9 percent of households had the connection to a centralised sewage treatment plant<sup>17</sup>. However nearly 62 percent of this sewage (draining to a centralised plant) was not treated in 2015, due to the absence of adequate capacity of treatment plants. Nearly 50 percent of rural households and about 12 percent of urban households have no drainage system for the waste water which is generated<sup>18</sup>.

The untreated sewage from households and other establishments reach water bodies directly or indirectly. This is the major source of water pollution in cities like Bangalore<sup>19</sup>. A significant part of the pollution in rivers, like Ganga, originates from households and commercial establishments and not only from industrial units<sup>20</sup>. Most of those water bodies located in/near, or flowing through, population settlements are polluted severely, and the largest source of pollution is untreated sewage (Rani and Shankar, 2014). There are no serious inspection to reduce pollution from agriculture<sup>21</sup>. Excessive silt, fertilisers and pesticides from farm fields reach water resources.

In general, the urban environment of India continues to be badly polluted. The annual mean concentration of particulate matter (PM10) was 329 µg/m<sup>3</sup> whereas the WHO guideline value is only 20 (during the period 2008-12) (Jain and Palwa, 2015). The corresponding value for PM2.5<sup>22</sup> is 153 for which the desirable level is 10. This is visible not only in big or metropolitan cities but also in smaller ones and towns. Probably, the dust and other suspended matter are ALSO? higher in the atmosphere of smaller cities and towns (Jain and Palwa, 2015)<sup>23</sup>. Ambient air pollution is identified as the fifth biggest cause of mortality in India (Atkinson, Cohen, Mehta, et al. 2011). Indian cities today are among the most polluted areas in the world and it is estimated that outdoor air pollution leads to approximately 670,000 deaths annually (Lim et al., 2013). Needless to mention the air pollution caused by motor vehicles and health costs associated with it. More than 60 percent of the pollution in the form of carbon and nitrous oxides are from transport vehicles (CPCB, 2012).

Solid-waste disposal continues to be an intractable problem all over India. Out of the total waste collected, only 12.45% waste is scientifically processed and rest is disposed in open dumps (CPCB, 2013). If we reckon certain other issues like noise pollution (CPCB, 2015) it is hardly recognised as a problem in India. All these failures indicate one major trend. The main source of such pollution is the millions of households and small establishments. Or an improvement in this regard requires changes in the behaviour of population as a whole, and investments in households and commercial establishments and also by governments.

### **3 GOVERNMENTS' ABILITY TO CONTROL POLLUTION AND THE POLITICAL ECONOMY**

Are different governments capable to control these sources of pollution? There seems to be two trends in the enforcement of environmental regulations in India. It may be relatively easy for the state to act against one or a few industrial polluters (though there could be issues of corruption and delays here). On the other hand, the enforcement is very lax against the pollution created by the multitude of households and small establishments<sup>24</sup>. When the people involved here are part of the mainstream society deciding the outcome of elections and the electoral fate of political parties, the enforcement of environmental regulations is not that easy. This is the reflection of the changed political economy in the sense that the deepening of democratisation in the country may have led to a gradual erosion in the elite control of governments in India (Santhakumar, 2014).

Hence the changed situation makes clearer the linkage between political economy and environmental regulation on the one hand, and environment and human development on the other hand. Though India has made internationally comparable environmental regulations, it is known that their enforcement is very weak (Agarwal, 2005; OECD, 2006; Shroff and Jejurkar, 2011). There is action on the part of enforcement agencies only when some concerned people approach courts through public-interest litigations or take other public actions (Santhakumar, 2003). The enforcement is near absent in other localities and contexts.

It indicates the possible connection between environmental protection and human development. Those who demand the enforcement of environmental regulations are those who are aware of, and concerned about, but are also those who are likely to be part of a socioeconomic group. Such a demand is visible more among sections of the middle-class in cities or in places where there has been an improvement in human development. However, the size of this class in the country is small. The share of what can be called global middle class in India could be around 5% of the entire population (Brandi and Buge, 2014). If we keep out the population which can be called poor and vulnerable (NCEUS, 2007), the remaining is only around 25%. Moreover this middle-class is spread out in different cities/parts of the country and thinly in its rural areas.

There are arguments that the political economy influences the way public interest litigation for pollution control are finally concluded. An observer familiar with recent cases of Public Interest Litigation in Indian courts makes the following comment: 'First, when environmental protection comes in conflict with socio-economic rights of the poor and the marginalised, the poor usually gets side-lined. Second, when environmental protection comes in conflict with projects backed by powerful and vested commercial and corporate interests—perceived by the court as “development”—environmental protection issues again take a back seat<sup>25</sup>. I am not underestimating the role of poorer sections of society in environmental protection in India as in the case of chipko movement<sup>26</sup> (which XXX) or in the struggles against mining companies<sup>27</sup>. Some of these are led by middle-class activists. In those cases, where marginalised social groups resist a project for its negative impacts on the environment, powerful lobbies may bulldoze the resistance. This, again, shows the connection between environment and human development.

Environmental activists in India and elsewhere<sup>28</sup> have not recognised adequately this connection between environmental management and human development. This may be due to the tendency among some of them to see all development interventions as harmful. Their opposition to economic growth as the sole metric of development is genuine. However, if this opposition is extended to an inclusive human development, it could be counter-productive. Though environmental-justice movements (Taylor, 2000) focus on the rights of under-privileged groups, a paradigm which ensure their human development and the environmental protection for the whole society is yet to emerge in countries like India. This is not to argue that people would become environment-friendly as and when they undergo the process of human development. This is discussed in the following section.

#### 4 ENVIRONMENT AND DEVELOPMENT: A NEW LOOK

There is some evidence that indicates the role of education (which is part of human development) in contributing to people's environmental awareness. A recent assessment (in 2011) in UK, based on data from more than 22,000 individuals, observed that highly educated people are more likely to display their environmental credentials through what they buy rather than with actions such as turning off lights<sup>29</sup>. According to this study, people with degrees are, on an average, 25% more likely (than those with no education) to adopt pro-environmental behaviours, in terms of paying more for environmentally-friendly products. However, there is no evidence to indicate that higher educated people are likely to turn off the TV overnight or to use public transports. Hamilton (2011) notes that education does not have a simple positive effect on the concern about climate change.

Another way to look at this issue is to see whether educated people, on average (after controlling for other relevant factors), are willing to pay more for protecting environmental resources. One such study examined the patterns of willingness to pay across households with different incomes and countries with different levels of GDP, using household-level data from the third round of the World Values Survey (WVS) (Israel and Levinson, 2004). This survey has covered 70,000 respondents in 48 countries. The study found strong relationships between (marginal) willingness to pay (MWTP) for environment and individual characteristics, such as age, income, and education. It could see more educated respondents in general willing to pay higher amounts than those respondents who have less formal education. However they could not see any systematic linkage between this WTP and the economic growth of the country<sup>30</sup>.

People should be ready, as and when they undergo certain level of human development, to pursue ways to be happier, say by leading a meaningful and joyful life, that do not require a substantial increase in consumption which needs the excessive use of natural resources. Better-off sections of society may have to get out of status-based consumption. When a part of the consumption is for achieving or maintaining social status, a general increase in income to all may not lead to much additional satisfaction (Reference- there are some studies for this). If somebody struggles to acquire more income to buy a scooter, seeing that a few others in the community have scooters, then his level of satisfaction may not go up substantially when he finally purchase it, if by that time many others in the community have bought a car.

There may not be any fulfilment of satisfaction of status consumption if others' consumption goes up perennially. This is related to the income inequality that exist in societies. If inequality results in the deceleration of the achievement of happiness, then that is to be reckoned as a negative outcome. To some extent, such a problem arises when unequal wealth held by some is leading to public expression of opulent consumption. This may encourage the not-so-wealthy or the normal people to emulate the consumption of the rich. They may struggle to earn more income, but a greater part of that would be used to emulate the consumption of the wealthier, and this can become a constantly moving target. Thus for many people, there may not be a tangible improvement in satisfaction or happiness despite an increase in consumption and income. On the other hand, there may be temporary fulfilment of satisfaction when the objective of consumption is to meet innate needs. Hence there is a view that too much focus on status consumption need not be a desirable trait. It may be desirable for individuals to develop habits (or internalize norms) that enable them to concentrate on consumption oriented to innate needs rather than status, which is more like a mirage<sup>31</sup>.

All these may require deep awareness, openness, and a new enlightenment on the part of individuals and an appropriate reorientation of institutions and norms in society. However such a 'super-structure' cannot be built on an underdeveloped society.

## NOTES

<sup>1</sup> Based on International Monetary Fund World Economic Outlook (April-2017).

<sup>2</sup> Nearly three-fourths of the population in India has an average per-capita daily consumption expenditure of less than Rs 20 per day in 2005 (NCEUS, 2007).

<sup>3</sup> <http://hdr.undp.org/en/composite/HDI>

<sup>4</sup> Since data is not available on many aspects of environment

<sup>5</sup> <http://www.mospi.gov.in/statistical-year-book-india/2016/202>

<sup>6</sup> Mishra et al (2009) notes: Following a biogeography based protected area (PA) planning exercise for India (Rodgers & Panwar 1988) there has been a rapid expansion of PA networks in the country (Rodgers et al. 1999) that has helped conserving a significant part of the country's biodiversity.

<sup>7</sup> They live in forests and are comparable to indigenous people in Latin America.

<sup>8</sup> Ramachandra Guha (2007) notes: Muslims and Dalits have been able to constitute themselves as an interest group on the national stage—they are treated in popular discourse as communities that are pan-Indian. On the other hand, tribal claims remain confined to the states and districts in which they live. Unlike the Dalits and the Muslims, the adivasis continue to be seen only in discrete, broken-up, fragments.

<sup>9</sup> The following states have not implemented FRA in 2016: West Bengal, Bihar, Himachal Pradesh, Karnataka, Telangana, Uttar Pradesh, Kerala, Uttarakhand and Jharkhand. See, <http://www.livemint.com/Politics/Rh9S8NYRnVfhoBfWDAm5yO/Govt-asks-nine-states-to-implement-Forest-Rights-Act-immedia.html>.

<sup>10</sup> One account shows that 'air pollution has caused over 4.2 million early deaths across the globe in 2015, out of which India and China alone accounted for 25.7 percent and 26.1 percent respectively'. <http://thediplomat.com/2017/03/report-china-and-india-have-worlds-deadliest-air-pollution/>; another account is the following: 'About 1.4 million people in the South Asian nation and 1.6 million in its northern neighbour died of illnesses related to air pollution in 2013'. <https://blogs.wsj.com/indiarealtime/2016/02/16/india-and-china-have-most-deaths-from-pollution/>

<sup>11</sup><http://www.worldwatch.org/node/3862>.

<sup>12</sup> Delhi is more like Brasilia. It's the capital city accommodating the central government, and other national and international institutions. It is not an industrial city unlike Mumbai or Kolkata.

<sup>13</sup> The percentage of urban households using LPG has increased from 44.2 in 1999/2000 to 68.4 in 2011/2012 (Government of India, 2015) as noted in Parikh et al (2016).

<sup>14</sup> For an interesting account of this issue in India, see Spears and Coffey (2017)

<sup>15</sup><http://unicef.in/Whatwedo/11/Eliminate-Open-Defecation>

<sup>16</sup>One estimate is the following: During 2015, the estimated sewage generation in the country was 61754 MLD as against the developed sewage treatment capacity of 22963 MLD. Because of the hiatus in sewage treatment capacity, about 38791 MLD of untreated sewage (62% of the total sewage) is discharged directly into nearby water bodies; ENVIS Centre on Hygiene, Sanitation, Sewage Treatment Systems and Technology. [http://www.sulabhenviis.nic.in/Database/STST\\_wastewater\\_2090.aspx](http://www.sulabhenviis.nic.in/Database/STST_wastewater_2090.aspx). This estimate does not take into account the pit-toilets in India.

<sup>17</sup> [http://censusindia.gov.in/2011census/hlo/Data\\_sheet/India/Latrines.pdf](http://censusindia.gov.in/2011census/hlo/Data_sheet/India/Latrines.pdf).

<sup>18</sup> Swachhta Status Report 2016, updated on 25th November, 2016.

<sup>19</sup> A study notes: 90% of the lakes were sewage-fed due to sustained flow of untreated sewage and industrial effluents, dumping of solid wastes and building debris. <http://wgbis.ces.iisc.ernet.in/energy/wetlandnews/news-2016/india-water-portal-more-than-90lakes-are-polluted-or-encroached-110316.pdf>

<sup>20</sup> Here is an account: Approximately 3 billion litres of raw, untreated sewage are dumped in the river on a daily basis. The amount has more than doubled in the last 20 years and experts predict another 100% increase in the following 20 years. Industrial effluents are about 12% of the total volume of effluent reaching the Ganges. <http://ganga-ma.blogspot.in/2014/06/the-holy-ganga-river-ganga-is-holiest.html>

<sup>21</sup> The major problem of agricultural diffuse pollution appears to be the heavy silt loads, along with large quantities of dissolved salts, nutrients, organics and even heavy metals and bacterial contaminants washed off during floods (Agarwal, 1999). Diffuse agricultural water pollution in India, G.D.Agarwal, Water Science and Technology, Volume 39, Issue 3, 1999, Pages 33-47

<sup>22</sup> This 2.5 is the size of the particle in microns.

<sup>23</sup> Transport is not the main source of pollution caused by particulate matter.

<sup>24</sup> Anil Agarwal, the Former Director of CSE has noted the following: Moreover, in a democratic country like India, the large number of small enterprises make them powerful "vote banks," why politicians do not want to touch them. Dilemma in the Developing World Small-Scale Industries Drive India's Economy But Pollute Heavily: What Can Be Done? by Dr. Anil Agarwal, <http://environmentportal.in/files/Small%20scale%20industries.pdf>

<sup>25</sup> Quoted from Rosencranz et al (2011).

<sup>26</sup> For an account see, Jain, S. (undated), Standing up for trees: Women's role in the Chipko Movement, <http://www.fao.org/docrep/r0465e/r0465e03.htm>

<sup>27</sup> <https://www.survivalinternational.org/tribes/dongria>.

<sup>28</sup> The historical background of environmentalism has traits of anti-capitalism and anti-modernisation. See, Brulle (2000); Global environmentalism also is driven partly by a well-off middle class with increasingly post-materialist values. See, Buechler (1995). In addition, the deep ecology movement have taken the discourse away from a perspective of human development (Naess, 1973).

<sup>29</sup> These are findings from Understanding Society, the world's largest household panel survey, funded by the Economic and Social Research Council (ESRC) and managed by the Institute of Social and Economic Research (ISER) at the University of Essex. [http://www.esrc.ac.uk/news-and-events/pressreleases/15029/When\\_it\\_comes\\_to\\_the\\_environment\\_education\\_affects\\_our\\_actions\\_.aspx](http://www.esrc.ac.uk/news-and-events/pressreleases/15029/When_it_comes_to_the_environment_education_affects_our_actions_.aspx) (opened on 14 May 2014).

<sup>30</sup> However, the actual evidence for this hypothesis is mixed. There is evidence confirming such a relationship for some environmental variables. Grossman and Krueger (1995) found that sulfur dioxide and dark matter suspended in atmosphere increases with per capita GDP at lower income levels but decreases with per-capita income at higher income levels. Shafik and Bandopadhyay (1992) found that in addition to sulfur dioxide and suspended particles, fecal coliform in water too follows a pattern similar to EKC. Hettige, Lucas and Whheler (1992) could see the toxic-intensity of the manufacturing firms per unit of GDP declines as GDP increases at higher income levels (confirming an EKC hypothesis in this regard). Hence the predicted relationship between environment and economic growth seem to be valid for certain pollutants. These include dust particles in the atmosphere, sulfur dioxide and water pollution. Selden and Song (1994) could include oxides of nitrogen and carbon monoxide too under this category.

<sup>31</sup> One of initial treatment of the negative externality of status good consumption can be seen in Frank (1985).

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