Chapter 1

Environmental Policy and Governance in a Federal Framework: Perspectives from India

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The pollution haven hypothesis which posits that investors from industrialised nations are attracted to developing countries with weak environmental laws has been a recurring theme in the literature on trade and environment, particularly in the context of competitiveness and environmental regulation (Birdsall and Wheeler, 1993; Copeland and Taylor, 2004). The basic question is whether differences in environmental standards and enforcement provide an unfair competitive advantage to some countries, and how this should be addressed. Similar questions could also be asked in the sub-national context for large federal countries: does interjurisdictional competition for investment, both domestic and foreign, manifest itself through differences in environmental standards and enforcement? If so, how should national governments respond in what has been dubbed a "race to the bottom"? This paper attempts to address these issues by examining the legislative and institutional framework for environmental protection in the context of India's federal structure and the Indian experience with the so-called "race to the bottom" which describes the tendency of businesses to move to places where the wages are lowest and laws are weak?

The bulk of economic literature on federalism in India has focused on fiscal federalism (Singh and Srinivasan, 2008; Rao and Singh, 2007). There has been little work in the area of environmental policy and its role in intergovernmental relations in India. To keep the paper focused, environmental problems related to natural resource degradation such as soil erosion, deforestation, biodiversity, or desertification are mentioned in passing, and are not dealt with explicitly.

Environmental Policy and Federalism in India

The regulatory regime for environmental protection in India is a picture of sharp contrast. The country has elaborate statutes and regulations on almost every conceivable area from hazardous waste to forests and wildlife. Yet, monitoring and enforcement capabilities remain weak. This section examines the division of environmental policymaking between national, state, and local governments in India. Much of the discussion focusses on the *de jure* division rather than the *de facto* situation. However, since much of the latter follows from the former, it is important to understand how the division is supposed to work.

Constitutional provisions *vis-a-vis* environment: accident or design?

The division of responsibility between different tiers of government, including environmental matters is governed by the Indian constitution. The sharing of environmental policy formulation between the central, state and local governments reflects the manner in which the constitution was originally framed and the way in which it has subsequently been interpreted and amended.[1] In this context, it should be kept in mind that the division of power *vis-a-vis* the environment between the centre and the states in India is simply a by-product of the overall devolution of power. The Indian constitution provides for a federal structure within the overall framework of a parliamentary form of government. While states have some degree of autonomy, ultimate authority rest with the central government. For instance, the centre can create new states; alter the boundaries of existing states (Article 3) and under special circumstances, even take over their governance (Article 356). Part XI of the Constitution ("Relations Between the Union and the States") governs the division of legislative and administrative authority between the centre and states. Article 246 divides the subject areas for legislation into three lists: Union List, State List, and Concurrent List[2] (Table 1). The Union List comprises 97 subjects over which parliament has exclusive powers to make laws. Apart from defence and foreign affairs, the list also includes environmentally relevant subjects such as interstate rivers and river valleys,[3] mines and minerals, oil fields, atomic energy, air traffic, and so on. The State List gives state governments exclusive jurisdiction over areas such as public health and sanitation, agriculture, land improvement and water management.[4] Under the Concurrent List, both central and state legislatures can enact laws on subjects ranging from forests and wildlife[5] to factories and electricity.

In addition, the centre has the residual power to legislate on any subject not covered in the three lists (Article 248).[6] The balance is tilted further in its favour by three additional constitutional provisions: (i) a central law on any subject in the Concurrent List generally prevails over a state law on the same subject (Articles 251 and 254); (ii) it can legislate in the "national interest" on any subject in the State List (Article 249), and (iii) it can also pass laws on state subjects if two or more state legislatures consent to such legislation (Article 252)[7].

The centre has used another constitutional provision to take the lead in enacting environmental laws, namely, Article 253. This article empowers the national assembly to enact laws arising from not only treaties to which India is a signatory, but also decisions made at any international conference[8]. Particularly striking about this article is that it allows the central government to enact laws merely on the basis of decisions of an international conference or association, even though such decisions may not be legally binding upon India. This article in conjunction with other similar constitutional provisions such as Article 51(c), enables the centre to legislate on virtually any entry in the State List[9]. What this means in effect is that anything on the State List is fair game as far as the centre is concerned[10]. In fact, two major environmental statutes in India, namely, the Air (Prevention and Control of Pollution) Act of 1981 and the Environment (Protection) Act of 1986, have been enacted under this very provision by citing the United Nations Conference on the Human Environment at Stockholm (1972)[11]. Similarly, the Biological Diversity Act 2002 and the National Green Tribuanl Act 2002 were enacted in the wake of the UN Convention on Biological Diversity signed in Rio de Janerio in 1992[12]. In February 2012, the state of West Bengal was directed to draft a policy for wetlands by the Kolkata High Court after India became a signatory of the Ramsar Convention for protection of wetlands[13].

The Institutional Framework for Environmental Management

The UN Conference on the Human Environment in Stockholm in 1972 is a landmark in the evolution of environmental policy in India. Preparations for India's participation in the conference acted as a catalyst in the formation of a National Committee on Environmental Planning and Coordination (NCEPC). The committee was the forerunner of the Department of Environment (DoE) which eventually became the present Ministry of Environment and Forests (MoEF). Its main job was to plan and coordinate with the actual implementation carried out by the various government ministries and agencies (Table 2).

In January 1980 the central government set up a committee chaired by N.D. Tiwari, then deputy chairman of the Federal Planning Commission, to recommend legislative measures and administrative machinery for environmental protection. The Tiwari committee made extensive recommendations including, *inter alia*, the establishment of a Department of Environment in November 1980 as a agency under the central government in charge of coordinating national policies for environmental protection and resource management, as well as administrative responsibility for pollution monitoring and regulations. In 1985, DoE was transferred to the newly created MoEF. It is currently the nodal agency in the administrative structure of the central government for the planning, promotion and coordination of environmental and forestry programmes. In tandem with these developments at the centre, almost all states and union territories have established environmental boards similar to those of the national committee. Most of these have since been converted into environment departments.

There is another important set of environmental institutions in India that were established even before the DoE. These are the central and state pollution control boards (CPCB and SPCBs) initially created under the Water (Prevention and Control of Pollution) Act. Unlike MoEF, the pollution control boards are statutory bodies which main function is to monitor pollution and take the neccessary measures to improve air and water quality. In other words, their mandate is to implement and enforce the major pollution control laws (Jasanoff, 1986). State pollution control boards are found in all states now. The central board coordinates the activities of the state boards as well as the federally administered union territories. Its role includes the compilation of data on air and water pollution, and more importantly to lay down ambient and emission standards for both air and water.

Evolution of the Legal Framework for Environmental Protection

Antecedents to current legislation

Unlike the recent origin of the institutional framework discussed in section II, environmental statutes in modern India date back at least to the mid 19th century (Ramakrishna, 1984) with laws such as the Indian Forest Act of 1865 and 1878. Other environmental aspects such as air and water pollution as well as wildlife were also covered. For example, the Shore Nuisance (Bombay and Kolaba) Act of 1853, was one of the earliest laws to address water pollution and had authorised the Collector of Land Revenue in Bombay to order the removal of any nuisance in Bombay harbour. Similarly, under the Oriental Gas Company Act of 1857, fines could be imposed on the Oriental Gas Company and compensation paid to anyone whose water was "fouled" by its discharges. The Indian Easement Act of 1882 guaranteed the property rights of riparian owners against "unreasonable" pollution by upstream users. The

division of responsibility between states and the central authorities was also introduced by the Government of India Act (1935). Some of the earliest statutes aimed at curbing air pollution include the Bengal Smoke Nuisance Act of 1905 and the Bombay Smoke Nuisance Act of 1912. The Elephants' Preservation Act of 1879 and the Wild Birds and Animals Protection Act of 1912 are among the earliest pieces of legislation in the field of wildlife protection. After independence in 1947, laws such as the Factories Act of 1948 and the River Boards Act of 1956 contained further provisions for water pollution controls[14]. These early legislative efforts, however, tend to have limited territorial reach and it would, thus, be fair to characterize them as generally piecemeal and inadequate.

Legislation on water pollution

It was not till the 1970s that the federal government started enacting more wide-ranging and comprehensive environmental laws starting with the Water (Prevention and Control of Pollution) Act of 1974[15], which was notable for the degree of consensus between the centre and the states. Six states had passed resolutions in 1969 urging parliament to legislate on water pollution[16]. By the time the Act came into force in 1974, a total of twelve states had joined the consensus in a remarkable instance of voluntary surrender of legislative authority to the central government[17].

The Act is very much in the nature of a "command and control" regulation: it prohibits the discharge of pollutants into water bodies beyond established standards (Section 24) and requires generators of all new and existing sources of discharge into water bodies get the prior consent of pollution control boards (Sections 25 & 26). It also lays down penalties including fines and imprisonment for non-compliance. Prior to 1988, enforcement was through criminal prosecutions initiated by state boards and by seeking injunctions to restrain polluters. After amendments to the Act in 1988, boards were given more teeth in that they can shut down errant factories or cut off their water or electricity by administrative orders.

As mentioned in section III, the Act created a regulatory apparatus in the form of central and state water pollution control boards. These boards have the power to establish effluent standards which are enforced by approving, rejecting, or modifying applications for consent to discharge effluents. However, since this Act was enacted through Article 252, states had discretion in setting up water pollution boards and as of 1982, six states had not established these boards. However, the 1988 mendments increased the power of the central board *vis-a-vis* the state boards under section 18 of the Act, enabling the central government take over the functions of a state board that has failed to comply with its directions.

A major gap in the Act was, however, the absence of any provision for the funding of boards, despite the range of functions they were expected to perform. Thus, the Water (Prevention and Control of Pollution) Cess Act of 1977 was passed to help meet the expenses of the central and state water boards. The Act requires designated industries[18] and local governments such as municipalities to pay a water consumption tax (Table 3).

Legislation on air pollution

The primary statute in this area is the Air (Prevention and Control of Pollution) Act of 1981. In direct contrast to the Water Act which was justified on the basis of decisions by subnational entities, the Air Act was based on the decisions of a supranational body, namely, the 1972 UN Conference on Environment (see section II). The Act is nationwide in its scope and states that had not set up pollution boards under the Water Act were now required to

establish them. Under this Act all industries have to obtain consent from state boards to operate within air pollution control areas delineated by the boards.[19] In practice, however, all states have declared themselves as entirely air pollution control areas. Thus, the whole of India is *de facto* an air pollution control area.

A legislation to end all legislation?

The Environmental Protection Act of 1986 (EPA) was enacted in the aftermath of the Bhopal tragedy. It takes a comprehensive definition of environment[20] and arms the centre with extensive powers "to take all measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating industrial pollution." (EPA, 1986, Section 3). Under the Act the central government has set nationwide ambient air quality standards as well as standards for vehicle emissions and discharge of effluents.

Thus, EPA *prima facie* appears to be an "umbrella" legislation. When introducing the bill in 1986, the Minister of State for Environment and Forests, Z.R. Ansari stated that "although there are existing laws dealing directly or indirectly with several environmental matters, it is necessary to have a general legislation for environmental protection, which, *inter alia*, should enable coordination of action of the various regulatory authorities, creation of an authority or authorities with adequate powers for environmental protection, regulation of discharge of environmental pollutants and handling of hazardous substances, speedy response in the event of accidents threatening the environment and deterrent punishment to those who endanger human environment, safety, and health." (as quoted Hadden, 1987: 719 en:38). The long wish list notwithstanding, there is little in EPA that is really new. Also, despite its all-encompassing title, it focuses narrowly on "brown" issues such as pollution and hazardous substances at the expense of other serious environmental problems such as deforestation.

From the viewpoint of environmental federalism, however, the EPA is quite significant since it tilts the balance firmly towards the centre: the states can have standards that are more (but not less) stringent than the centre. Section 3(2) of the Rules clearly states, "the central board or a state board may specify more stringent standards from those provided in Schedule I to IV of the EPA rules." Similarly, the states can reduce but not increase the time allowed for an industry to comply with standards. In recent years, environment regulations have taken a step further to set up administrative and judicial bodies with more teeth. The National Green Tribunal has been set up as an appellate body for environment cases. Laws have also been enacted specifically for hazardous waste management[21] under which organisations have to seek authorisation from the appropriate state pollution control boards.

Rationale for the dominance of the centre in environmental regulation

As argued in section II earlier, the centripetal tendencies in environmental legislation are largely a by-product of the dominance of the centre in the constitutional set-up, as well as characteristics of the Indian polity and economy. In fact, India had a closed and controlled economy in which the centre had a very dominant role *vis-a-vis* the states and the private sector until 1991, when major economic reforms were launched. It not only played a key role in determining the pattern and location of resource allocation in large scale projects in a wide range of industries such as steel, power and chemicals, but also dictated the private investment quantum. States were only bit players and hence it seems unlikely that the interstate competition for investment or the "race to the bottom" played any significant role in

environmental regulation. The marginalisation of states in investment decisions may partly explain two puzzling aspects of the legislation on water and air pollution mentioned above. In both cases states yielded more power to the centre than they had to. Several states voluntarily asked the centre to legislate on water pollution and all states voluntarily designated the entire country as an air pollution control area under the Air Act.

"Race to the bottom": conceptual and empirical issues

Normative aspects

Two quite distinct issues are involved here: One, should environmental standards vary spatially? And who should set these standards? These issues are conceptually quite separate: a single standard setter does not necessarily imply a single standard, and *vice versa*. Thus, a central agency (such as CPCB) could in principle set different standards for different regions based on carrying capacity, or some other criteria. By the same token, if sub-national agencies were to set standards for their jurisdictions, they could still converge to the same standard due to interjurisdictional competition. Here, I address these issues purely from a normative perspective of economic efficiency. Thus, the answer to the first question is an unambiguous yes, and to the latter "it all depends."

For local pollutants, that is, those not generating any externality outside the jurisdiction, it stands to reason that environmental standards can vary spatially. Given jurisdiction-specific marginal social damage (MSD) and marginal abatement cost (MAC) functions as shown in Figure 1, pollution emission standard $P(i)^*$ should be set so that $MSD_i = MAC_i$ for any jurisdiction i (i = 1, ..., n). A uniform standard, P*, would lead to welfare losses as indicated by the shaded triangles. While the magnitude of welfare loss will depend on the shapes and location of the different MSD and MAC curves, it seems plausible that these curves will vary considerably among jurisdictions. With respect to the former, since the MSD curve for each jurisdiction i, is the vertical summation of individual willingness-to-pay for environmental quality, it will depend on the number of people and their preferences for environmental quality. The curve will also be a function of the assimilative capacity for pollution in that jurisdiction.

Figure 1. Uniform versus differentiated standards

(Baumol and Oates, 1988)

In other words, the aggregate demand for environmental quality in a jurisdiction (as reflected in the shape and position of the MSD curve) will depend, *inter alia*, on its population density, income levels and geographical factors. It is also likely that abatement costs will vary across regions depending on the composition of industrial activity and the age of the plants and equipment, among other things. In sum, as Baumol and Oates (1988: 287)[22] point out, "the optimal level of environmental quality in one jurisdiction is unlikely to coincide with that in another."

The conclusion above would obviously not hold if the effects of the pollutant extend to other jurisdictions. In such cases, environmental standards would have to be set such that the externality was internalised.[23] This implies that in the presence of interjurisdictional externalities: (i) the optimal level of environmental standards would be more stringent than

otherwise, and (ii) standard setting at the local level may not take these externalities into consideration. There are, however, a large number of pollutants that are local in character, and for which local environmental standards are appropriate.

An answer to the question of *who* should set environmental standards has to be sought in the larger context of interjurisdictional competition. If such competition is perceived as harmful, then environmental standards should be set by the national government. On the other hand, if such competition is viewed as beneficial, then standards should be set by local governments.

The case for harmonisation of environmental standards is based on the perception that competition among jurisdictions is harmful and can lead to sub-optimal levels of public goods including environmental quality (Spatareanu, 2007; Oates 2001; Gray and Shadbegian, 1998). Proponents of this view advocate national minimum standards for environmental quality to avoid 'destructive interregional competition.' The problem with this approach, however, is that if environment is a normal good, then there is a trade-off between environmental degradation and bringing more jobs and economic activity into the jurisdiction by relaxing environmental standards.

Looking at the issue of harmonisation of environmental standards from a different angle of trade and environment, there have been opposing arguments on whether trade would lead to a "race to the bottom" or a "race to the top". On one hand, setting standards could lead to a "regulatory chill" or weak enforcement of standards in developing countries. On the other, a school of thought in public finance regards interjurisdictional competition as a disciplining force that forces public agents to make efficient decisions (Tiebout, 1956; Brennan and Buchanan, 1980; Stigler, 1957). This has also been supported by empirical evidence (Wheeler, 2001; Dasgupta et.al., 2002). Evidence from empirical work looking at cross-country data, FDI trends from USA and Europe and WTO trade negotiations suggestes that along with environmental regulation, factors like heterogenous preferences and/or differences in endowments and technology across economic entities, level of pollution of industry, size of export market, as well as whether trade is North-South or South-South will affect optimal environmental standards (Xing and Kolstad, 2002; Wagner and Timmins, 2009; Chau and Kanbur, 2006; Dinda 2004). It may hence not be appropriate to strictly link environment with trade issues (Bhagwati, 2000; Bhagwati and Srinivasan, 1996).

In this sense, what might be perceived as a race between states is merely the logical outcome of heterogenous preferences and/or differences in endowments and technology. To clarify, I am not arguing that a deliberate "race to the bottom" is a good thing. It certainly is not. What I am trying to say is that differences in environmental standards across states are not undesirable, and that all such differences should not be attributed to a "race to the bottom" phenomenon. The conclusion then is a mixed one: while there is an unambiguous case for spatially varying environmental standards, there is only qualified support for the beneficial effects of interjurisdictional competition. However, even if harmonisation of environmental standards were desirable, *a priori*, given the absence of a "race to the bottom" in any meaningful sense in India, such harmonisation has not been required so far.

Is there a "race to the bottom" in India?

From the discussion of EPA in section IV it is evident that Indian states cannot compete by lowering environmental standards. In this sense, environmental standards in India are already harmonised at some minimum levels. It is, of course, possible that states may get around this

de jure restriction by *de facto* lax enforcement. By an analogous argument, states may leverage the powers devolved to them post-1991 liberalisation (Rudolph and Rudolph, 2001) to enforce higher than national environmental standards. For instance, states like Kerala which are heavily dependant on tourism revenues would have a greater incentive to be stricter than national norms. Given the scope of this paper, a rigorous empirical examination of this proposition is not attempted here. Research along these lines should be quite fruitful and interesting.[24]

Short of an econometric approach, however, it is difficult to disentangle the effect of environmental regulations *per se* from the other factors that also influence location decisions. While it may be possible to order states in terms of the stringency of their environmental regimes and expenditure on environment (Table 4), location decisions may be influenced by a host of other factors such as availability of transport and communications infrastructure, power, access to markets and raw materials, and amicable labour relations, to name a few. With respect to infrastructure, states in India differ greatly and this is made worse by its overall inadequacy. A comprehensive index for infrastructure also reveals a wide disparity among Indian states -- from around 70 for Arunachal Pradesh and Jammu and Kashmir to above 180 for Punjab and Goa (Table 5).[25] It is interesting to note that the performance of states in terms of infrastructure has not changed considerably over time. This can be seen by looking at break-up of physical infrastructure indicators. For instance, the density of the rail and road network and teledensity varies considerably across states, even at per square area and per capita terms (Table 6). This variation could be a key factor in influencing location decisions. A simple comparative exercise shows that states with better transport and communication connectivity also experience higher growth and gross income. Hence, it is plausible that the policy levers in interstate competition for investment may comprise, *inter alia*, provision of better and/or subsidised infrastructure rather than an environmental "race to the bottom."

In general, it seems more logical for state-level policymakers to induce investment with more substantive "carrots" than those afforded by lax environmental standards. This is not only due to the fact that other factors loom large in location decisions, but also because enforcement of environmental laws is quite weak in India. Therefore, these regulations are often perceived as non-binding constraints. Weak enforcement is partly due to the precarious finances of the SPCBs. For instance, the funds made available to the West Bengal SPCB "in the first year of its operation hardly even covered the expenses of the chair and member-secretary of the Board" (Ramakrishna, 1984). Moreover, most SPCBs have very few lawyers on their payrolls to initiate and follow up on litigation.

In the Indian context, one can go even further and question the "race to the bottom" hypothesis. In fact, it has been observed to the contrary that state agencies often work at cross purposes and at loggerheads over environmental issues. For instance, back in 1990s, the government of Tamil Nadu had gone to the Supreme Court to seek a relaxation of the effluent standards for tanneries set by the Tamil Nadu Pollution Control Board (TPCB)![26] On the other hand, the Karnataka Pollution Control Board (KPCB) was taken to task by the state legislature for not enforcing environmental regulations stringently[27] while in Orissa, it was the SPCB that "expressed its dismay over the (state's) inaction to the problem of high fluoride pollution by the National Aluminium Company Limited (NALCO) at Angul identified by the board" (The Financial Express, 1996). These cases suggest that state governments are pluralistic in nature with competing interest groups such as the SPCBs,

individual departments or ministries each pursuing its own agenda. The objectives of SPCBs in particular, are quite different from those of state governments. Given the tight budgetary positions of SPCBs mentioned earlier, revenue considerations often dictate their actions when it comes to implementing environmental laws.

Another interesting aspect is the extent of judicial activism, particularly by the Supreme Court and state High Courts in enforcement. With the establishment of the National Green Tribunal, this is expected to further strenghtened. The Supreme Court[28] for example, decided in a landmark judgment in 1995 that the right to environment was a part of the Right to Life of Indian citizens, as enshrined in the Constitution. On the basis of this judgment, there have been a series of court orders and injunctions leading to closures of polluting factories with civic bodies, environmental officials as well as central and state pollution control boards taken to tasks.

In a nutshell, courts in India, particularly the Supreme Court, are not only legislating from the bench but are also taking over the functions of the executive branch[29]. This will have far reaching consequences for environmental legislation as well as enforcement, across sectors and states. For instance, the Supreme Court asked the Union Government to implement 29 directives vide an order passed in 2003, (one of which led to the Hazardous Waste Management and Handling Rules 2003), and followed up on its implementation in October 2011 by asking the Government to file an affadavit on the compliance status with its directives[30]. I do not wish to go into the reasons for judicial activism. Much of it, however, has been triggered by public interest litigation which in turn may reflect frustration with the bureaucracy and lack of faith in it for managing the environment. Judicial activism adds another set of players in the making of environmental policy in India, and further complicates the analysis of a "race to the bottom." State governments have to now contend with SPCBs as well as the appropriate High Court, Supreme Court and the National Green Tribunal.

Concluding Remarks

Based on secondary data of the nature examined in this paper, there is not much evidence at the state level, to either support or reject a "race to the bottom" hypothesis vis-a-vis environmental regulations. It does appear though that a host of other factors such as the availability of infrastructure do play a major role in interstate competition for investment. Further, given the weak enforcement of environmental laws and regulations, it is quite plausible that they are not perceived as a major cost of doing business in India. This may, however, change given the high degree of judicial activism witnessed recently in many environmental cases.

In any event, there is a need to examine the data more carefully and collect primary data before the "race to the bottom" question can be answered conclusively. Further, even if the conclusion of the suggested exercise is in the negative at this stage, it is plausible that an environmental "race to the bottom" could surface in the near future as economic reforms and liberalisation and the trend towards coalition governments at the centre hasten the process of decentralisation. In such a situation, a *de facto* harmonisation of environmental standards would have to be considered seriously.

Appendix

Table 1: Constitution of India: Environment related subjects

Union List

52	Industries
53	Regulation and development of oil fields and mineral oil resources
54	Regulation of mines and mineral development
56	Regulation and development of inter-State rivers and river valleys
57	Fishing and fisheries beyond territorial waters

State List

6	Public health and sanitation
14	Agriculture, protection against pest and prevention of plant diseases
18	Land, colonisation, etc
21	Fisheries
23	Regulation of mines and mineral development subject to the provisions of List-I
24	Industries subject to the provisions of List-I

Concurrent List

17A	Forests
17B	Protection of wild animals and birds
20	Economic and social planning
20A	Population control and family planning

Table 2: Subjects under Ministry of Environment and Forests

1. Environment and Ecology, including environment in coastal waters, in mangroves and coral reefs but excluding marine environment on the high seas.
2. Environment Research and Development, education, training, information and awareness.
3. Environmental Health.
4. Environmental Impact Assessment.
5. Forest Development Agency and Joint Forest Management Programme for conservation, management and afforestation.
6. Survey and Exploration of Natural Resources particularly of Forest, Flora, Fauna, Ecosystems etc.
7. Bio-diversity Conservation including that of lakes and Wetlands.
8. Conservation, development, management and abatement of pollution of rivers, which shall include National River Conservation Directorate.
9. Wildlife conservation, preservation, protection planning, research, education, training and awareness including Project Tiger and Project Elephant.
10. International co-operation on Issues concerning Environment, Forestry and Wildlife.
11. Botanical Survey of India and Botanical Gardens.
12. Zoological Survey of India.
13. National Museum of Natural History.
14. Biosphere Reserve Programme.
15. National Forest Policy and Forestry Development in the country, including Social Forestry.
16. All matters relating to Forest and Forest Administration in the Union territories.
17. Indian Forest Service.
18. Wild Life Preservation and protection of wild birds and animals.
19. Fundamental and applied research and training including higher education in forestry.
20. Padmaja Naidu Himalayan Zoological Park.
21. National Assistance to Forestry Development Schemes.
22. Indian Plywood Industries Research and Training Institute, Bangalore.
23. Afforestation and Eco-Development, which shall include National Afforestation, and Eco-Development Board.
24. Bio-fuel plantations in forest, wastelands and environmental issues concerning bio-fuels.
25. Desert and Desertification.
26. Forest Survey of India.
27. Indian Institute of Bio-diversity, Itanagar.
28. Central Pollution Control Board.
29. G.B.Pant Institute of Himalayan Environment & Development.
30. Wildlife Institute of India and Indian Board for Wildlife.
31. Indian Institute of Forest Management.
32. Central Zoo Authority including National Zoo Park.
33. Indian Council of Forestry Research & Education.
34. Andaman and Nicobar Islands Forest and Plantation Development Corporation Limited.
35. Prevention of cruelty to animals.
36. Matters relating to pounds and cattle trespass.
37. Gaushalas and Gausadans.
38. The Prevention of Cruelty to Animals Act, 1960 (59 of 1960).

39. The National Environment Tribunal Act, 1995 (27 of 1995).
40. The National Environment Appellate Authority Act, 1997 (22 of 1997).
41. The Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974).
42. The Water (Prevention and Control of Pollution) Cess Act, 1977 (36 of 1977).
43. The Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981).
44. The Indian Forest Act, 1927 (16 of 1927).
45. The Wild Life (Protection) Act, 1972 (53 of 1972)
46. The Forest (Conservation) Act, 1980 (69 of 1980).
47. The Environment (Protection) Act, 1986 (29 of 1986).
48. The Public Liability Insurance Act, 1991 (6 of 1991).

Note: - The Ministry of Environment and Forests will be responsible for overall policy in relation to forests, except all matters, including legislation, relating to the rights of forest dwelling Schedule Tribes on forest lands.

Source: Cabinet Secretariat (1961)

Table 3: Water Cess Rates

Purpose for which water is consumed	Maximum rate under sub-section 2 of section 3	Maximum rate under sub-section 2(A) of section 3
	(all figures in paise per kilolitre)	
Industrial cooling, spraying in mine pits or boiler feeds	5.00	10.00
Domestic purpose	2.00	3.00
Processing whereby water gets polluted and the pollutant are easily bio-degradable and are toxic	10.00	20.00
Processing whereby water gets polluted and the pollutants are not easily bio-degradable are toxic	15.00	30

Source:Water (Prevention and Control of Pollution) Cess Act, 1977 (as amended up to 2003)

Table 4: Allocations by States for Environment and Ecology Sectors

Figures in Rs million

		2007-08 Actual expenditure	2008-09 Anticipated expenditure	2009-10 Annual Plan Outlay
1	Andhra Pradesh	—	—	—
2	Arunachal Pradesh	1.2	2.0	4.0
3	Assam	0.8	5.0	10.0
4	Bihar	—	—	—
5	Chhattisgarh	7.3	—	10.0
6	Goa	22.7	30.6	33.6
7	Gujarat	30.9	50.0	100.0
8	Haryana	16.6	15.0	15.5
9	Himachal Pradesh	1.3	—	—
1	J&K	—	10.6	16.6
1	Jharkhand	—	—	100
1	Karnataka	65.0	109.6	109.6
1	Kerala	3.2	100	101.5
1	Madhya	147.0	110.7	119.8
1	Maharashtra	—	—	—
1	Manipur	35.6	53.5	65.0
1	Meghalaya	7.2	9.5	12.5
1	Mizoram	0.4	0.4	0.5
1	Nagaland	0.7	—	—
2	Orissa	65	114.3	104.3
2	Punjab	48.1	153	104.5
2	Rajasthan	4.7	2.6	2.0
2	Sikkim	5.6	5.5	17
2	Tamil Nadu	29.5	90.1	17.2
2	Tripura	12.6	8.4	10.9
2	Uttar Pradesh	477.2	445.5	114.7
2	Uttaranchal	—	—	—
2	West Bengal	86.0	130.0	200.0
2	A&N Islands	—	—	—
3	Chandigarh	30.2	24.0	24.2
3	D&N Haveli	—	—	—
3	Daman and Diu	0.2	5.0	2.8
3	Delhi	165.7	100.2	150.0
3	Lakshadweep	5.5	7.2	16.7
3	Puducherry	5.5	5.5	7.5
	Total	**1275.7**	**1588.2**	**1473.2**

Source: Planning Commission (2008)

Table 5: Index of Economic and Social Infrastructure: Indian States

	1994		1999	
	Index	**Rank**	**Index**	**Rank**
Andhra Pradesh	99.19	12	103.30	11
Arunachal Pradesh	48.94	25	69.71	25
Assam	81.94	15	77.72	17
Bihar	92.04	13	81.33	15
Goa	192.29	3	200.57	1
Gujarat	123.01	7	124.31	6
Haryana	158.89	4	137.54	5
Himachal Pradesh	80.94	16	95.03	13
Jammu & Kashmir	76.07	17	71.46	24
Karnataka	101.20	11	104.88	10
Kerala	205.41	2	178.68	3
Madhya Pradesh	65.92	23	76.79	18
Maharashtra	121.70	8	112.80	7
Manipur	70.38	22	75.39	22
Meghalaya	73.75	19	75.49	21
Mizoram	61.85	24	82.13	14
Nagaland	70.92	20	76.14	19
Orissa	74.46	18	81.00	16
Punjab	219.19	1	187.57	2
Rajasthan	70.46	21	75.86	20
Sikkim	104.62	10	108.99	9
Tamil Nadu	149.86	5	149.10	4
Tripura	83.55	14	74.87	23
Uttar Pradesh	111.80	9	101.23	12
West Bengal	131.67	6	111.25	8
All India	**100.00**		**100.00**	

(Anant et al,. 1994; 1999)

	State Income		Roads in States			Railway in States			Phones
State/UT's	State GDP in '000s 2010-11	Growth of State GDP 2010-11	Total Road Length (in km) March 2011	Per 100 sq. km of Area March 2011	Per one lakh of population (March 2011)	Rail km in 2010-11	Rail km per 100 sq. km of area (March 2011)	Rail km per lakh (100,000) population (March 2011)	Tele-density* (March 2012)
Andhra Pradesh	382	9.96	2,38,001	86.53	281.11	5,264	1.91	6.22	80.87
Assam	74	7.34	2,41,789	308.26	775.73	2,434	3.10	7.81	46.61
Bihar	144	14.77	1,30,642	138.74	125.85	3,612	3.84	3.48	48.9
Chhattisgarh	79	11.16	93,965	69.51	367.91	1,187	0.88	4.65	
Delhi	192	10.92	29,648	1,999.18	176.97	183	12.34	1.09	238.6
Goa	21	8.3	10,627	287.06	729.01	69	1.86	4.73	
Gujarat	365	10.47	1,56,188	79.68	258.66	5,271	2.69	8.73	91.14
Haryana	166	9.59	41,729	94.38	164.59	1,540	3.48	6.07	89.42
Himachal Pradesh	39	8.8	47,963	86.15	699.53	296	0.53	4.32	120.67
Jammu & Kashmir	39	6.63	26,980	12.14	215	256	0.12	2.04	54.82
Jharkhand	78	6.01	23,903	29.99	72.51	1,984	2.49	6.02	
Karnataka	280	8.87	2,81,773	146.92	460.94	3,073	1.60	5.03	97.22
Kerala	193	9.13	2,01,220	517.77	602.68	1,050	2.70	3.14	106.61
Madhya Pradesh	183	8.17	1,97,293	64.01	271.76	4,955	1.61	6.83	53.88
Maharashtra	775	10.47	4,10,521	133.41	365.32	5,602	1.82	4.99	96.83
Odisha	128	8.6	2,58,836	166.23	617.05	2,461	1.58	5.87	65.84
Punjab	149	7.04	84,193	167.18	303.9	2,134	4.24	7.70	112.9
Rajasthan	204	10.97	2,41,318	70.51	351.67	5,784	1.69	8.43	73.11
Tamil Nadu	391	11.74	1,92,339	147.89	266.62	4,062	3.12	5.63	116.47
Uttarakhand	51	7.37	49,277	92.14	487.08	345	0.65	3.41	
Uttar Pradesh	394	7.86	3,90,256	161.98	195.54	8,763	3.64	4.39	60.91
West Bengal	318	7.06	2,99,209	337.13	327.55	3,937	4.44	4.31	79.91
NORTH-EAST States excluding Assam	55	54	14,420	804.68	337.65	168	1.53	1	65.92
ALL INDIA	4886	8.39	46,90,342	142.68	387.57	64460	1.96	4.31	

* Teledensity numbers: Bihar includes Jharkhand figures, UP includes Uttarakhand. GDP at constant 2004-05 prices

Note: GDP indicators greater than median in text color red, transport infrastructure indicators greater than Median in Green. States with transport infrastructure greater than median in 3 or more categories highlighted

Table comprised by author using the following sources: Indian Railways (2011), Ministry of Statistics and Programme Implementation (2012), Ministry of Road Transport and Highways (2012) & TRAI (2012)

Notes

[1]The words "central" or "centre" in the Indian context refer to the federal government. According to Article 1 of the Constitution, India is a union of states. There are 28 states and 7 union territories at present. The latter are directly administered by the central government. The federal legislature, also known as Parliament, comprises two houses, Council of States (upper house) and Council of People (lower house). In the paper, the words "centre", "central" and "Parliament" are used interchangeably.

[2] These are List I, II, and III, respectively, in the Seventh Schedule of the Constitution of India.

[3] "Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is *declared by the Parliament* by law to be expedient in the public interest." (7th Schedule, List I, entry 56, Constitution of India, emphasis added).

[4] "Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage, and water power subject to the provisions of entry 56 of List I." (7th Schedule, List II, entry 17, Constitution of India).

[5] Forests and environment was shifted from the State List to the Concurrant list of the Constituion by addition of Article 48A to the Indian Constitution in 1976.

[6] To make things more explicit, the 97th and final entry in List I of the 7th Schedule (Union List) is: "Any other matter not enumerated in List II or List III including any tax not in either of those Lists."

[7] It was under this very provision that the first major federal environmental legislation, the Water (Prevention and Control of Pollution) Act of 1974, was enacted by the Indian Parliament

Recall that "water" is otherwise a state subject. The role of Article 252 in the enactment of the Water Act was discussed in detail in section IV

[8] "Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries *or any decision made at any international conference, association or other body*." (Article 253, Part XI, "Relations Between the Union and the States," Constitution of India, emphasis added).

[9] "The State shall endeavour to foster respect for international law and treaty obligations in the dealings of organised people with one another" (Article 51(c), Part IV, Directive Principles of State Policy, Constitution of India). In addition, entries 13 and 14 of the Union List empower the centre to respectively, "participate in international conferences, associations and other bodies and implement decisions made thereat", and sign and implement "treaties and agreements with foreign countries".

[10] Almost five decades ago a scholar predicted an "inevitable and irresistible invasion of the state list by the Parliament under Article 253 of the Constitution," because of "the vast range of subjects covered by the conventions, treaties, agreements and recommendations of various specialized agencies and international conferences" to which India belonged (Looper, 1957, p.305-06). If anything, the variety of these subjects has only increased over time. Such division of power between the central and state governments was the main issue debated by the Constituent Assembly in the 1940s. See generally, Austin (1966), Rao (1968), and Seervai (1996), and also the debates of the Constituent Assembly of India. The "debate over where to locate authority to regulate environmental matters was primarily a manifestation of this more fundamental power dispute." (Ramakrishna, 1984, p. 910)

[11] For example, the preamble to the act on air pollution states, "Whereas decisions were taken at the United Nations Conference on the Human Environment held in Stockholm in June, 1972, in which India participated, to take appropriate steps for..... the preservation of the quality of air and control of air pollution; *and whereas it is considered necessary to implement the decisions aforesaid in so far as they relate to the preservation of the quality of air and control air pollution;* be it enacted by Parliament in the Thirty-second year of the Republic of India." (Air Prevention and Control of Pollution Act, 1981, as cited in GOI 1995, p. 131). Similar wording is contained in the preamble to the Environment (Protection) Act, 1986, which also cites the Stockholm conference as its *raison d'etre* (see GOI 1995, p. 213)

[12] Under the Biological Diversity Act 2002, National and 25 State Biodiversity Authorities have been set up. Under the National Green Tribuanal Act 2010, 5 seats have set up throughout India to provide judicial and administrative remedies to victims of pollution and environment damage

[13] Kolkata High Court, *Forum for Human, Legal and Ecological Rights, Bansdroni & Another v. The Union of India and Others., against Writ Petition No.606 of 2011*

[14] Section 12 of the Factories Act requires all factories to make "effective arrangements" for waste disposal. It also empowers state governments to frame rules to implement this directive. River Boards established under the River Board Act for the regulation and development of interstate rivers and river valleys, also have powers to prevent water pollution

[15] This Act has precursors such as the Orissa River Pollution Prevention Act of 1953 and the Maharashtra Prevention of Water Pollution Act of 1970. The latter Act emphasised negotiation of effluent standards with industry

[16] It "was the culmination of over a decade of discussion and deliberation between the centre and the states." (Rosencranz et al. 1991, p. 65)

[17] Water is a state subject in the 7th Schedule of the Indian Constitution

[18] These 16 "dirty" industries include *inter alia*, industries such as ferrous and non-ferrous metallurgical, mining, ore processing, petroleum and petrochemicals, cement, textile, paper, fertilizer, coal, etc.

[19] Section 19 (1) of the Air Act states quite explicitly that, "the state government may, after consultation with the state board, by notification in the official gazette *declare in such manner as may be prescribed, any area or areas within the state as air pollution control area or areas for the purposes of this Act*." (GOI 1981)

[20] "Environment" includes water, air, and land and the inter relationship which exists among and between water, air, and land, and human beings, other living creatures, plants, micro-organisms and property" EPA, 1986, section 2(a)

[21] 29 directives issued by Supreme Court of India in order dated 14 October 2003, in the matter of Writ Petition (Civil) No. 657 of 1995, Research Foundation for Science, Technology and Natural
Resource Policy vs. Union of India and others: one of the directives proposed changes in Hazardous Waste Management Rules (2003)

[22] This conclusion is also valid in an *inter-temporal* sense. In other words, for the reasons cited above not only should standards vary spatially, but also over time, jurisdictions can get more crowded, incomes can rise, and so on.

[23] "From a supra-regional efficiency viewpoint, those creating the environmental impacts in a region should bear the social costs not only of the impacts within the region, but on those outside that region." (Harris and Perkins, 1985) op. cit.).

[24] Theoretical and empirical literature in recent years has explored the question of fiscal federalism for environmental issues, since the seminal paper by Oates and Schwab (1988) (Kruger et al., 2007; Kunce and Shogren, 2005; Levinson, 2003; Oates, 2001). Some work suggests that like tax efficiency, pollution efficiency is also best left to the local administration, as in the case of EU which has given considerable flexiblity to member countries. Alternatively, it is argued that devolved environmental regulation is "second-best" as local citizens do not capture economic rents fully. Others have also highlighted the role of central governments in encouraging research in environmental science and efficient technology.

[25] Eight major sectors are covered under this index, namely, agriculture, banking, electricity, transport, communications, education, health, and civil administration. The first five are classified as economic infrastructure, the next two as social infrastructure, and the last one as administrative infrastructure. For details see Anant et al. (1994).

[26] "TN to move SC against TPCB", Financial Express, New Delhi, January 8, 1996.

[27] "Pollution Board comes under fire", Deccan Herald, Bangalore, March 2, 1996. In its interim report the State Legislature Subject Committee on Revenue, Forest, Ecology and Environment Department was very critical of the KPCB for not taking action against polluting industries, granting environmental clearance to firms without proper studies, and entering into an agreement with polluting industries in order to get a case withdrawn from the state High Court.

[28] *Supreme Court in Virulent Gar vs State of Haryana 1995(2) SCC 577*. The judgement also referes to Art. 48-A, Art. 47 and Art 51A(g), and Art. 21 of the Indian Constituion, and Principle 1 as laid down in the Stockholm Declaration of 1972 : *"Enjoyment of life and its attainment including their right to life with human dignity encompasses within its ambit, the protection and preservation of environment, ecological balance free from pollution of air and water, sanitation without which life cannot be enjoyed. Any contra acts or actions would cause environmental pollution. Environmental, ecological, air, water, pollution etc should be regarded as amounting to violation of Art. 21."*

[29] Focusing only on pollution for the moment, a sampling of recent headlines in Indian newspapers illustrate this point:"MP plant suitable for trial burning of Bhopal waste: Govt to SC" (Anand, 2013), "India Court Orders Pollution Agency on Sterlite Time Extension" (Patnaik and Shanker, 2012), "India: Supreme Court asks where Yamuna river cleanup money disappeared" (Overdorf, 2012), "Vedanta shares tumble as Indian court shuts smelter on pollution grounds" (The Economic Times, 2010), "Supreme Court seeks CPCB report on ground water contamination" (PTI, 2012),
"Lower noise level around IGI Aiport: Delhi HC" (The Times of India, 2010), "SC asks Madhya Pradesh about action on safe water to gas victims" (The Times of India, 2012).
As can be noted, the orders include interpretation of existing laws directions, directions to executive, monitoring of executive's compliance with previous directives, as well as resolving disputes. See Centre for Environment Law Education (2012).

[30] Supreme passed an October 11, 2011: "We direct the respondent, Union of India/Government of India to consider the report of the Monitoring Committee prepared by Dr. D.B. Boralkar and Dr. Claude Alvares, the directions contained at page 541 of the aforesaid judgment and a copy of the submissions filed on behalf of the writ petitioner on 21st September, 2011, and to prepare a note as to what steps have been taken to implement the directions and, if the same have not been implemented, as to why the same have not been implemented. While considering the aforesaid report and judgment, the Government of India shall also consider the other judgment in the same matter reported in (2005) 13 SCC 186. Let this matter be adjourned till 15th November, 2011...": in the Supreme Court of India, Civil Original Jurisdiction Writ Petition (C) No.657 of 1995, Research Foundation for Science, Petitioner Technology And Natural Resource Policy vs Union of India and others

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