Chapter 3
Environmental Struggles and Innovations in India: An Historical Perspective

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Abstract An historical account of environmental transformations in India, with drivers of such changes, is presented in this chapter. The account starts from the period of the Indus Valley Civilization and ends in the situation in present-day India, especially the period of high rates of economic growth in the past two decades. The main driver for environmental change was growth in population caused by both in-migration and natural growth, while the main environmental change was deforestation for agriculture, and to a lesser extent for expanding human settlements. There have been numerous environmental struggles as a result. At a later stage, water systems were transformed to expand irrigation and water supplies. The chapter identifies two significant innovations based on and prompted by environmental struggles. The first innovation was the community-based resistance to commercial forest felling in the present-day Indian state of Uttarakhand where, in the early 1970s, local people opposed the practice of appointment of wealthy private contractors from faraway cities for felling of forest trees, mainly for large paper and pulp industries. Instead, the movement wanted community-based controlled felling to feed local timber- and resin-based small industries. In 1974 the common people of village Reni, especially women, took the innovative step of nonviolent obstruction to forest felling by a contractor. The second innovation described in the chapter is on the introduction of the Public Interest Litigation (PIL) by the Supreme Court of India. This innovative step has significantly helped strengthening of environmental justice in India.

Keywords Environmental changes in India • Judicial innovation • Medieval transition • Social innovations • Sustainable environment • Vedic period

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3.1 Environmental Changes in India: From Ancient Time to the Post-Colonial Period

3.1.1 From the Vedic Period Onwards

The area that has historically been understood as India is quite larger than the area covered by the post-colonial nation state of the same name born in 1947. The erstwhile region generally understood as India in a civilizational sense is better described as South Asia of today. Historians have identified the Harappan or Indus valley (in present-day Pakistan) culture as a remarkable aspect of civilization in that area (Possehl et al. 1989; Singh 1995). Since that period, that can be called the Vedic age, for over about five millennia, the relationship between the humans and their immediate natural environment has been dynamic, ranging from being symbiotic (Somvanshi 2006; Weber 2003) to predatory. The Vedas (2500–1500 BC), especially *Rig Veda*, offer a number of ecological insights that the current scientific knowledge and literature on environmental sustainability would echo. For example, a verse from the Rig Veda would say that, "the sky is like father, the earth like mother and the space as their son. The universe consisting of the three is like a family and any kind of damage done to any one of the three throws the universe out of balance" (Renugadevi 2012: 1). In Vedic scriptures one also finds a clear visualization of the earth's ecosystems with emphasis on maintaining their balance. Another verse from Rig Veda says: "Thousands and hundreds of years if you want to enjoy the fruits and happiness of life, then take up systematic planting of trees" (Renugadevi 2012). Yet another verse says: "Rivers occasion widespread destruction if their coasts are damaged or destroyed and therefore trees standing on the coasts should not be cut off or uprooted" (Renugadevi 2012).

In the absence of an equivalent of an informed civil society as seen in present-day industrialized societies, important changes in the environment have often been related with policies of the clans and rulers as well as broad ups and downs in the lives of the civilizations. For instance, the recent research conducted by Dixit et al. (2014a) indicates that the changes in the climate were one of the most potent reasons behind the decline of the Indus Valley civilization, on which a more detailed analysis has been made by Lahiri (2000).

The Vedic settlements attracted new inhabitants, who kept coming from the north and northwest, over centuries in search of greener pastures in the *Sapta-Sindhu* region, a region of seven rivers in the northwestern parts of the subcontinent (Saxena 1972; Radhakrishna 1999; Dhavalikar 2007). The early Vedic texts mention about their living standards, conflicts, methods of worship and various caveats of subsistence pattern (Sharma 2006; Jha 1998). These texts mention terms like *Gopati* (owner of cattle), *Duhitri* (daughters who milch the cows), *Aditi* (Mother of the Gods), *Indra* (God of water), *Varun* (God of wind), *Agni* (God of fire), etc. which relate to the natural environment and the pastoral cattle wealth. At this stage very few food crops find such a significant mention, which points towards their pastoral and semi-nomadic lifestyle (Gupta 1991; Thapar 1970). In the later Vedic texts, the

number of reference to food crops increased and newer deities were associated with many other functions of life. All this newer knowledge was gained through the growing interaction of humans with nature (Chakravarti 2009; Biswas and Arun 2007). The archaeological evidences and emergence of terms like *Bhupati* (owner of land) indicate a shift in the focus of the economic activities towards greater availability of land and practice of settled agriculture. This also marks the dawn of proprietary relationship with land (Chakravarti 2009; Prakash 1964; Dhavalikar 2007). Interestingly, in Kashmir, in the prehistoric times, domesticated dogs, who guarded the animal wealth, were buried beside their masters. Over centuries, the role of the dogs became limited only to guarding the periphery of the habitat of their masters (Pande 1970; Thapar 1985; Sharif and Thapar 1992; Russell 2002; Higgs 1976). These developments are the indicator of a slow but gradual shift in human's relation with the natural environment and the way they dealt with it. The stories from the *Upanishads* have also indicated about the conflicts between humans and nature per se, where the superiority of symbolic Gods like *Agni, Varun, Indra and others* faced growing challenges from human's ability to transform and use the natural environment (Rogers 1993; Iyengar and Radhakrishna 2007; Hara 2009; Aurobindo 1998). For instance, the *Brihadaranyaka Upanishad*, one of the principal *Upanishad*s in the Vedanta tradition, resonates with the gestalt shift to "relational, total-field image", parting away from the "man-in the environment" image (Rangarajan 2008).

As Jha (1998) has pointed out, in this period clearing of forests was practiced by various clans across the north and the eastern parts of the subcontinent. A strong clan-based system was established by the end of the Vedic age and the human population was on expansive mode in creation of their territorial niche as *Janapada* (Basant 2008; Ahmed 1991; Chakrabarti 2000). This system provided both the social security and supported the sustenance needs of the inhabitants (Misra and Misra 2007; Sahi 1999; Kumaran 2014). The texts like *Ramayana* and *Mahabharata,* which were compiled sometime between 300 BC and 200 AD*,* elucidate the pace of *second urbanization* in the subcontinent led by the use of iron (Ahmed 1991). The epic *Ramayana* is profuse with such evidences. For instance, a manuscript of *Ramayana* holds the picture of coronation of Lord Ram with a variety of tools and weapons made of iron. This not only tells about the names and types of tools used by the people at that time but also the range of application of such tools. These were possibly made up of iron or some of its alloys with sharp pointed stylus for engraving and hatchet for cutting leaves from trees or in agricultural applications (Meher 2009). Rangarajan (2011) points towards the vast fauna through an instance from the epic *Ramayana* that "When Ram was set for his exile, his mother Kaushalya's fear for his safety was from huge swarms of elephants, lions, tigers, bears, boars or ferocious horned buffalo". Evidences of anvils, bellows, hammers, etc. and newly coined terms like *kudalika* indicate growing use of iron that heralded a rapid clearing of forests and expansion of agriculture. A similar legend on the uses of iron tools is mentioned in the texts like *Vishnu Purana* and *Skanda Purana*, describing Sage Parashurama, standing atop the Western Ghats hills in the western coastal parts of India with his iron axe (Chandran 1997). A similar picture of forest destruction is seen in the case of *Khandava Dahana* as a large forest area was set on fire, to burn not only the standing vegetation but also

the living beings in it, including humans, to create clear land for the proposed new capital city for the *Pandava*s.

Supported by good soil fertility and precipitation, agricultural surpluses led to the strengthening of new powerful kingdoms, like that of Magadha. However, the rigid *Varna* system was already established by this time, which paved way for the rise of *Heterodox* sects as a reaction (Gupta 1980; Jha 2014; Ravinder 2003). Buddhism and Jainism were two most important of these heterodox sects (Morrison 1997; Thapar 1975, 1990). These sects acted as a catalyst in cultural synthesis and changed the way the humans perceived and related to the natural environment. Stories of Jataka's and the famous legend of Elephant and the Buddha in the Parileyyaka forest is an indicator of how these heterodox sects tried bringing the humans and the natural environment in a symbiotic frame (Ramanathapillai 2009). Apart from this, many kings, merchants and scholars got influenced by Buddhism and Jainism. They promoted practices that worked for the conservation of nature. At this stage, the popular cult of worshiping trees had emerged, for example the *Aswath* (*Ficus religiosa*) planting of which is an important Buddhist tradition.

The age of Mauryas (322–185 BC) especially under its benevolent King Ashoka (268–232 BC) was an important period where the water security was given priority with excavation of storage lakes and expansion of irrigation. It was also at this time that growing respect for biodiversity can be witnessed. Hunting and deforestation was not done indiscriminately, as part of this concern for sustaining biodiversity. The Mauryan King Ashoka depicted exemplary compassion for wildlife and prohibited killing of certain species of animals (Somvanshi 2006; Tisdell 2005; Gupta 2011). For instance, the concept of conservation of fish in the subcontinent was advocated in 246 BC, the time of King Ashoka (Dubey and Ahmad-Naga 1995). Further, Ashoka established the first ever veterinary hospitals of the world (Iqbal et al. 2008). He along with the new heterodox sects paved way for a more compassionate and symbiotic relationship between the humans and the natural environment.

The period after the decline of the Mauryas saw a series of invasions from the northwest frontiers of the subcontinent which brought with the invasions, some fresh concepts and ideas. During the rule of the *Sakas* and their *Kshatrapas*, many enlightened kings like Kanishka brought more expansion of agriculture and land grants to the monasteries and temples. Their signs are seen from the inscriptions and excavations from Eran (Bajpai 1994) in the central part of India. The Junagarh inscription speaks about the Sudarshan Lake in Southern Gujarat in India which was constructed by Mauryan ruler *Chandragupta* (340–298 BC) and later repaired by a Saka king *Rudradaman* (130–150 AD). This lake irrigated fields until tenth century AD, but it does not exist today (Nene 2012).

The Age of the Gupta's (320–550 AD) saw the indiscriminate rise of land grants/charters to the local chieftains (Saletore 1943; Iqbal et al. 2008; Kosambi 1955; Ingalls 1976; Jha 1998; Sharma 2006). This marked the shift of the base of the economy to a decentralized rural and agrarian stage. As Mukhia (1985) indicated, the prevailing feudalism in the subcontinent flourished from the fourth or fifth century AD, as trade and urban centres declined. That process of strengthening of feudal organization of societies faced a decline in the eleventh or twelfth century when trade

and the process of urbanization once again advanced. This was the age (post-Gupta onwards) in which the Roman Empire was on the decline and its impact was also seen on the trade in the subcontinent (Sharma 2006). The grant of many more land charters to bring more land under cultivation indicates that the agricultural expansion got the highest priority at the cost of the forests. The economy of the subcontinent through this agricultural expansion became self-sustaining (James and James 2013). However, from the fall of the Mauryan empire till the age of the Guptas, the earlier practices were continued and the rulers tried to improve the existing forest policies. The ownership of forests was largely confined to the ruling kings who gave permission to the people for exploitation of forest resources (Rajarshi and Shaw 2013).

After the Guptas, the political epicentre of the subcontinent shifted from Pataliputra in eastern India to Ujjain and then Kannauj in northern India (Kumar 2009a; Sharma 2006). This age was of incessant conflicts known as tripartite struggle among the newly emerging vassals of either the Guptas or the Deccan kingdoms down South. However, this phase of political stir brought new features of interventions in the hydraulic regime with construction of reservoirs, check dams and bringing of the arcane forest areas under new rulers or victors of this struggle. For instance, the dense forests of central and eastern parts of the subcontinent were captured and local tribesmen were humbled and were slowly transformed socially by the expanding races, culturally and religiously (Biswal 2003; Sinha 1962). The constant destruction of the forests in favour of growing agriculture is the reason behind the serious loss of forest areas, for which no measures of protection were institutionalized. However, at the local customary levels conservation was practiced when forests were needed for supporting the agrarian economies. Agarwal and Yadama (1997) have analysed how community forest conservation works.

A striking feature of a different kind is seen in this period in the desert areas. A cooperative model of governance especially in the region of Rajputana, with brotherhood–clan relationship was established (Sinha 1962; Kulke 1995). The Rajputs who lived in the area transformed the semi-arid or arid region of present-day northwestern India into a hotbed of agriculture and pastoralism with concern for biodiversity. Their works were civil engineering marvels like lakes (Dhebar/Jaisamand, Udaisagar, Rajsagar) and check dams together with preservation of forests (Puri 1986; Kotraiah 1995; Barah 2003; Cox 2012). The Rajput rulers also acted as the protector of the wildlife by limiting the right to hunt in the wild (Kumar 2009b; Hughes 2015).

Quoting from the *Veda*s and *Upanishad*s, many environmentalists have declared the culture of the region as a "forest culture", imposing a deep commitment to the conservation of forests. Nevertheless, the ups and downs in concern for nature and phases of rapid deforestation are integral parts of environmental history of the subcontinent as the Vedic verses are. The continuous deforestation and expansion of agriculture in the region does not leave any doubt that the so-called *forest culture* was not a continuation and got replaced by a 'culture of deforestation', that is part of the process even today. It should be recognized that whatever forest cover exists today in the region, is the result of no 'forest culture' but the policy and rules of the colonial British administration.

3.1.2 Medieval Transition

Developments in West Asia again had its effect on the medieval Indian subcontinent. The decline of the Byzantine empire and the rise of the Arabs brought the influx of invaders from the North and the Northwest in the South Asian subcontinent. The glory of that land with plenty of water, rich flora and fauna, and surplus labour made the region an attractive target for invaders (Salehi and Shekari 2013). Since the beginning of the first millennium AD, there was no unified rule of a big empire in the subcontinent and it fell prey to the Turkish Sultans (Habibullah 1961). An era of rejuvenation, socio-cultural synthesis and diffusion of new knowledge started (Habib 1969a, 1985a). The Turks brought with them not only new military technologies but also new crops and their methods of assessment of land revenue with advanced techniques of cultivation like *saquia*, *charas* and *dhenkli*, which were used to lift water from the well (Habib 1985b). Banking on these strengths many rulers like Balban, Alauddin Khilji, Muhammad Bin Tughlaq and Firoz Shah Tughlaq expanded agriculture and built new irrigational facilities (Siddiqui 2006; Habib 1964). The Turkish Sultans learned further from the local wisdom of water conservation through stepwells (*Vav* in Gujarati and *Baori* in Hindi/Rajasthani) and began to build their own versions (Chattopadhyaya 1973; Livingston 2002; Jain-Neubauer 1999). Many such stepwells are still found in the present-day Delhi area (Rosin 1993; Siddiqui and Iqtidar 1986).

While in the South the magnificence of Vijayanagara empire was visible where away from the deltas in the interiors dense forests were cleared and many irrigational projects were built, bringing vast areas under agriculture (Kotraiah 1995; Barah 2003). In contrast to the northern parts, in south Indian society the sacred institution of temples played a very important role in the local economy. There were temple towns, which had the control over vast swathes of land with administrative and quasi-judicial powers. Further, these temples domesticated many animals like elephants in their premises (Fuller 1984; Morrison 1995). Temples in peninsular India played the dual role in urbanization and agricultural expansion. This trend was similar to the innovations deployed by the rulers in the northern parts of the subcontinent (Morrison 1995). In the context of the Pandyan Kingdom, Champakalakshmi (1996) identified the impact of the western sea trade in this process of urbanization. The Tamil kingdoms in south India also experienced a similar flowering of political, economic and cultural forces at these sacred sites and nucleated settlements that were the heart of this medieval civilization. In these temple towns, priests, traders, merchants and also *ganika*s (prostitutes) were major actors responsible for the promotion of urban growth (Heitzman 1987).

The prime importance of agricultural wealth kept the politics in the northern region quite volatile. This brought the entry of the Mughals in the beginning of the sixteenth century AD. The first Mughal ruler, Zahiruddin Babur in his *Tuzuk-i-Baburi* has mentioned a variety of wild animals like the rhinos, elephants, tigers, etc. along with a rich wealth of flora and fauna in the northern region (Beveridge 1902; Gupta 1989). As the wild landscapes declined and agriculture expanded, the

rhinos seen by Babur in Peshawar got extinct from the region. This story of extinction of a species from one part of the region is not an isolated one. Similar evolutions can also be seen in the other parts of this subcontinent. For instance, Elvin (2008) in his book "The retreat of the elephants: an environmental history of China" has explained how due to various human interventions and climatic changes, the elephants roaming in the Beijing region of China went missing and they are now limited to Myanmar and the North Eastern parts of India.

The forest regime in the medieval periods can be described explicitly or implicitly as community regimes (Kant 2000). In this regime, the subsistence needs of the local people were fulfilled from the vast tracts of forests (Kant 2001). Despite so much of agricultural expansion and community dependency on forests, the forest wealth of the subcontinent was still in a reasonable state of areal coverage. The main reason was that the land and water with few technical inputs were suitable for plant growth (Habib 1985b). For instance, Babur describes about the stepwells and describes one constructed by him at Charbagh, Agra (Habib 1985b; Beveridge 1902). After Babur, Sher Shah Suri, a ruler of Afghan origin, ruled the northern parts of the subcontinent for some years. The initiatives of the Suri king were interesting and beyond his time. His compassion towards creating environment friendly features like ponds, lakes, planting trees along the highways was indicative of the concept of sustainable use of the natural environment (Rakshit and Swaqpan 2005).

The conflict over land started to emerge over the flood plains of monsoon-fed rivers as the peak flows in monsoon months started to be seen as a curse. Famines spiralled and epidemic diseases started to rise (Harrison 1994; Stone 1984; Arnold 1986). Strict methods of revenue collection co-existed with instances of the rulers giving land revenue exemption to drought and calamity hit peasants (Gupta 1989). However, this trend has shown that the institutions of the rulers had found ways to adapt to peculiarities of the hydrological regime and processes in this subcontinent, the variability associated with the monsoon that occurs over space and between seasons. The influence of post-Ghazalian Islam through the Turkish and Mughal rule provided political stability to the subcontinent from 1206 to 1707 AD but with limited scientific discoveries (Khan 1992). Although there were a few innovations brought in the age of Mughal rulers Akbar and Jehangir, but that could not match the advancement of knowledge in Europe around the same period (Khan 1992; Habib 1980, 1985a).

Expansion in the agricultural production paved way for surpluses, helped in the growth of agri-based industries and consequent surge in domestic and international trade. This became one of the reasons for urbanization and the rise of medieval towns which were just an extension of villages or a cluster of villages coming together. There were other forces also which led to urbanization like popularity of Sufism that resulted in new urban centres like Nagaur, Ajmer, Burhanpur, etc. Such a phenomenon of rapid urbanization is indeed unprecedented and it has changed human geography of the region beyond comprehension. The cities and smaller towns constructed a new hierarchy marked by certain urban characteristics, which was the major casualty of this process of urbanization (Kundu 2011). The meteoritic urbanization and a vast expanding empire of Mughals created new social entities

(like Mansabdars, Jagirdars, Zamindars, Guild Merchants, Talukdars, Patwari, Khot, Muqaddams, etc.) in action within the economy. There were now new stakeholders in the system as a middle and lower middle class to taste the power and the peasantry was bound to be stretched to its limits in the period following.

The period after the death of Mughal emperor Aurangzeb (1707) prevented any significant innovations or steps towards the conservation of nature. As this era was full with variety of crisis pertaining to *jagirdari*, continuous conflicts and battles among the regional powers like Marathas and others in the Deccan, fresh invasion from the northwest (by Nadir Shah and Ahmad Shah Abdali) and series of feeble rulers and intense intrigues at the Mughal court. A pattern of expansion in demand, commercialization and urbanization can be seen at this time which along with colonial expansion continued the rampant exploitation of socio-economic and environmental wealth of the subcontinent for many decades (Roy 2002).

3.1.3 Transition to the Modern Era

The lack of strong centralized administration of the Mughals created conditions suitable for the Europeans to enter the subcontinent for trade in a big way. The Portuguese were the first to do so as they landed in Calicut as early as in 1498. In the beginning their interests were confined to trade and the religious expansion, but later they started annexing new territories. By the end of sixteenth century, the Portuguese and the Dutch got more involved in South America and Indo-China, respectively. The South Asian region then became wide open for the French and the British to expand. Due to a variety of reasons, the latter got an edge in South Asia. These ranged from winning battles (both in India and abroad), getting the royal *Farmans* (orders) and establishing dual system of governance together with a Mughal administration that was on the path of decline. One more reason for this was the age of enlightenment and scientific breakthroughs on which the strong mercantile interests was banking. The Europeans immensely benefited from the scientific knowledge that made available technologies of steam engine, railways, shipping, telegraph, botanical knowledge, etc. Finally, in the midst of chaos and anarchic situation, the East India Company emerged as a provider of stability and 'Rule of Law' in a region that fell into widespread social disorder.

The rule by the East India Company started a new era of colonial mercantilism that made the land, water and forests as the means of economic exchange (Wallerstein 1986, January 25). Slowly and steadily the colonial rulers customized the shape of agriculture as well as flora and fauna as per their requirements. Now Indian farmers were growing indigo and cotton. While large swarm of labourers were working on mining, deforestation and plantations of sugar and tea. The British also tried invading the subcontinent intellectually where the new form of anglicized knowledge became a tool for Macaulay's vision which targeted to make Indians, British in thoughts but genetically native.

The establishment of India's Reserved Forests was a big push in these times. The forest services were created to look after the exploitation and conservation of for-

ests (Rajan 1998). The forests that exist in the subcontinent today, almost without exception, were protected by law in the colonial period. On the other hand, gradually, the commercial interests of the colonial forest administration converted rich natural mixed forests to almost a monoculture of economically important varieties. They (Britishers) were world leaders in deforestation, having devastated their own resources as well as those of Ireland and other colonies (Kant 2000). Apart from this monoculture in forestry, displacement of the indigenous people was another issue. This displacement of people who herded, gathered forest products or cultivated land became the central feature of twentieth-century nature conservation in India (Rangarajan and Shahabuddin 2006). According to Mahesh Rangarajan, this displacement, which was carried out to enhance the levels of nature protection, has often been accompanied by impoverishment and dispossession of the displaced.

Similar transformation can be seen in agriculture which switched to cash crops like sugarcane, cotton, indigo, etc. (Brockway 1979; Cohn 1996). This was an era of agricultural transformation of nature in the agrarian and economic history of the subcontinent (Gadgil and Guha 1993). White (1967) described this process in the following words:

> *It was not until about four generations ago that Western Europe and North America arranged a marriage between Science and Technology, a union of theoretical and the empirical approaches to our natural environment. The emergence in widespread practice of the Baconian creed that scientific knowledge means technological power over nature can scarcely be dated before about 1850. Its acceptance as a normal pattern of action may mark the greatest event in human history since the invention of agriculture, and perhaps in nonhuman terrestrial history as well.*

Ribbentrop (1900) has earmarked the phase between 1796 and 1850 in different stages before the evolution of a structured and coherent British Forest Policy . Within a few decades of gaining the colony in South Asia, the British mastered the art of ruling the subcontinent and came up with a variety of enthralling colonial legislative instruments (Sivaramakrishnan 1995) that restricted the customary rights of the local people. The colonial legislative instruments like the Forest Act of 1878, which later served as a model for other British colonies had very serious consequences. With one stroke of the executive pen attempted to obliterate centuries of customary use of the forest by rural populations all over India (Guha and Gadgil 1989). Soon the local folks of the forests and the sons of the soil were uprooted from their land. A few of them were employed as forest guards. Apart from capture of the resources of the tribals they were criminalized for their lifestyles. For instance, *Yanadis*, who were "very partial to sour and fermented rice-water", were stopped by the Forest officers from drinking it, as it made them lazy (Tolen 1991). This had a negative effect on the native inhabitants and there emerged a series of protests, often violent forest movements of the forest-dwelling communities (Sarkar 1982, 2014). Such movements were meant for their access to natural resources of "*Jal, Jangal aur Zameen*" (Water, Forest and Land) (Xalxo 2007). However, as presented by Tian et al. (2014), the inevitable environmental change in India has been the changes in land use and cover from forests to cultivation, a trend that still continues.

The Indian National Congress took certain initiatives and brought numerous resolutions stressing on the suffering of the people caused by the forest administra-

tion. Resolutions condemning forest laws were passed every year between 1891 and 1895. However, the response was not very strong as the Congress also avoided such environmental issues by terming the conflicts as local (Sarkar 1982, 2014). Later in the Gandhian phase of freedom movement the battle entered the legal and legislative phase. This resulted in the emergence of environmental jurisprudence, starting a phase that made the natural environment a legal object in the British era. Here one can see the process of making of law, process of litigation, the formation of jurisprudence and the relationship that developed between the legislature and the political institution in the country at large (Sivaramakrishnan 1995).

The forces of colonial scientific knowledge from the west were often used in the subcontinent out of context or only as prudent for short-term gains. For instance, Dutt (1950) quoted the evidence given by Wallick (Superintendent of the Botanical Garden near Calcutta of the East India Company to the Commons' Committee as follows:

> *The husbandry of Bengal has in a great measure been misunderstood by the Europeans…….. very sudden innovations in them have never led to any good results…….for instance, when European iron ploughs got introduced into Bengal…….the soil being extremely superficial, which was intended to be torn up, has generally received the admixture of the under soil, which has deteriorated it very much.*

The role of religious and ethnic values in preserving the traditional community reserves and commons like the ancient sacred groves and rivers is important. Gadgil (1991) mentions in this connection the practice of village communities of preserving the biodiversity and unique ecosystems, such as the Myristica swamps of the Western Ghats. However, with social transformations and growth in population, the followings of such institutions have declined as has been shown by Singh (1995) on the landscape and sacred topography of the pilgrimage temple town Varanasi and its effect on the water quality of the river Ganga (Singh 1995). In the twentieth century, the British policy expanded the base for industrial production in South Asia, mainly for strategic reasons. Thus, in addition to drastic changes in land cover, the environmental changes now included industrial pollution of air and water. As the struggle for ending the colonial rule in the subcontinent progressed, popular aspirations for industrial growth and higher levels of individual consumption, nevertheless, did not deviate from the traditions created by colonialism.

In India, forest regimes have completed a full cycle, starting with the community regime in the pre-British period through state regimes during the colonial period, and finally an attempt back to community-based forest regimes in the 1990s (Kant 2001). During the colonial era in India, the changes in forest regimes were discontinuous, but path dependent in the geographical sense. In the first phase of independent India, many self-reinforcing mechanisms (such as increasing returns, organizational and institutional inertia, and adaptive expectations) contributed to temporal path dependence. However, environmental sustainability took a back seat as the British colonial rule ended in 1947. Even the so-called conservationists' attempts took new avatar in the name of protectionism with an exclusionary conservationist approach and elite environmentalism (Saberwal and Rangarajan 2005). The aspirations of the people in general, and the ruling class in particular, followed the traditional path of economic growth, not informed by the long-term environmental

losses. This sowed a seed for a very serious consequence, which India is still paying in its post-independence times. It was the discontinuity in the mutual symbiotic relationship between the humans and their environment. The forests, animals and the forces of nature which were worshipped since the ages were now an object of economic extraction, albeit in the short run.

3.2 Social Innovation in the Post-Colonial Period: Struggle for Forest Rights in the Himalayan Region

3.2.1 The Indian Himalayan Region and Uttarakhand

In the background of the above historical account, it can be seen that the natural environment of the subcontinent underwent rapid transition in the past century. Negative environmental impacts of economic activities enhanced environmental consciousness, and gave birth to environmental movements, based on a great variety of issues of environmental destruction and threats to lives. Probably the most known of these movements is the forest rights movement called *Chipko* (tree hugging) that emerged in the Uttarakhand area of the Indian Himalayan Region (IHR). The Himalayan arc of about 3000 km in length includes quite a large part of the border between China or Nepal or Bhutan and India. From a small village in the large mountain area of the Indian Himalaya emerged a social innovation for establishing forest rights of the local people and limits to forest exploitation. This innovation later became known as a globally celebrated forest rights movement.

During the later part of the decade of 1960s, mainly as a result of the armed conflict in 1962 between China and India emerging from disputes over border in the inaccessible Himalayan areas, rapid expansion of the network of roads in the interior areas of the Indian Himalayan Region (IHR) had been taken up in India as a national priority. The mountain communities in the inaccessible parts of the IHR largely practiced subsistence farming, in which tree fodder constituted vital provisioning services from the local forests. In addition, the forests provide vital sources of energy for cooking and space heating, in the form of fuel wood. The growing network of roads greatly improved the accessibility of these mountain areas. It strengthened the commercial links between the subsistence economies of the mountain villages and the market in the adjoining plains. In this way the natural resources of the interior Himalayan areas, especially forest resources and minerals, started to be extracted from ever larger areas and exported to the plains. In turn, the imports from the plains, especially food grains and consumer items, also increased rapidly. The enhanced availability of food grains and consumer items created new aspirations based on a need for higher cash flows in the mountain communities that traditionally practiced barter trade. While this dynamic transition was applicable for all the areas of the IHR, this section describes the social innovation that created a popular movement for forest rights of village communities in the area presently known as the State of Uttarakhand in the IHR (Fig. 3.1).

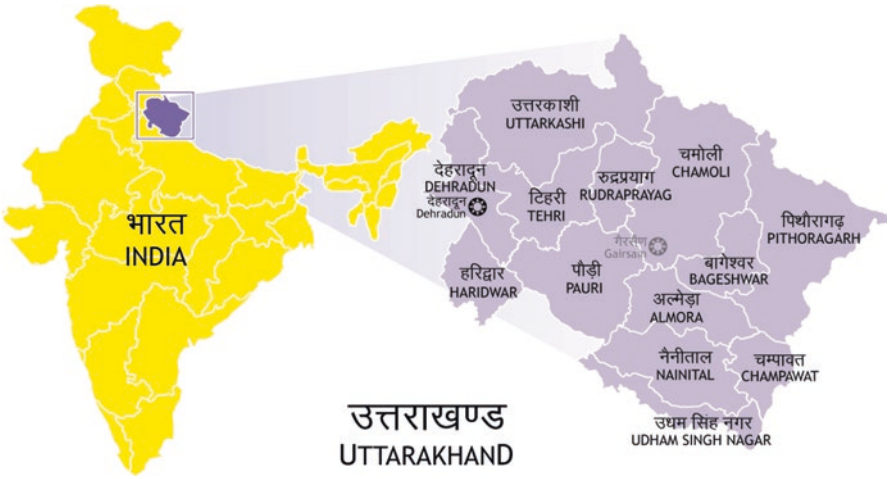

Fig. 3.1 Location of Uttarakhand in India (http://www.bing.com/images/search?q=Uttarakhand+India+Map&view=detailv2&&id=BA8C161BB6ED300AD6129F22777FA19152372951&selectedIndex=0&ccid=rzUelh85&simid=608027955303481479&thid=OIP.Maf351e961f39a39a3dcae510359a1753H0&ajaxhist=0)

3.2.2 People-Forest Linkages in Uttarakhand

Due to the orographic and climatic conditions in the Himalaya, the region had most of the land area (about 70 %) under forest cover or bare rocks and small areas (about 10 %) as farmlands, on which mountain communities practiced traditional subsistence farming. Use of timber from the forests was limited to making houses or agricultural tools. Green felling for commercial timber extraction was not part of this traditional framework.

Commercial extraction of the forests in Uttarakhand (Fig. 3.1) started when the British arrived as the rulers after their victory in 1815 in the war against the Gorkha kingdom of Nepal. The British started commercial forestry with the exclusive authority lying with the official Forest Departments and contractors selected by the Department. In this new management strategy, forest areas were reserved for large-scale commercial extraction with restricted access of the communities. The communities had no role in the commercial extraction of the forests, except as labourers, though most villages were near to the reserved forests. In the Tehri-Garhwal region, which was not under direct British rule, the impact of the forestry practices of the British was carried by a British timber merchant, Wilson. He entered into forest felling contract with the King of the princely state of Tehri Garhwal and made huge profits. Moench and Bandyopadhyay (1986) have given a systematic description of the linkages between the people and forests in the Tehri Garhwal region.

The commercial objectives and monopolistic functioning of the Forest Departments in India did not change much even when the colonial rule ended in 1947. Green felling and extraction of Pine sap continued to be undertaken in the

Chir Pine dominated forests of mid-hills of Uttarakhand. This was taken up by contractors who obtained permits from the State Forest Department through auctions conducted by that Department. These contractors were rich people and usually came from cities like Dehradun, Lucknow and Delhi, far away from the mountain villages. They prospered from the sale of timber and Pine sap, a process from which the local villagers did not benefit at all. The forest contractors were the de facto rulers of the remote mountain areas. The villagers had always seen this as an unjust transfer of wealth from the local forests around their villages by rich contractors coming from distant cities. With little scope for local employment, many in the IHR migrated seasonally or permanently to the cities in the plains in search of jobs. Such migration left the women and children back in the villages, which caused social problems and instability in the families.

3.2.3 Political and Economic Activism in Uttarakhand

During India's struggle against British colonial rule, the Uttarakhand region was active and a very good network of social activists of diverse political leanings was created. After India became independent, these activists devoted their organizational efforts towards social and economic uplift of the village communities. The network of Gandhian social activists in Uttarakhand functioned under the umbrella organization called *Uttarakhand Sarvodaya Mandal*. They took up organizing the people against widespread alcoholism among men, for social empowerment of women and protection of the forests.

Working on the idea of promoting local employment through small rural industries, based on local natural resources, the *Uttarakhand Sarvodaya Mandal* established a number of small industries to use local timber, medicinal herbs, Pine sap, etc. These small industries produced agricultural implements, furniture, resin, medicines, etc. Such rural industries were named *Gram Swarajya Sanghs* or autonomous village unions. The Forest Department gave these organizations permit for limited green felling and tapping of Pine sap. These small rural industries became a big inspiration for local people as possible creator of gainful employment opportunities within the mountain villages themselves.

In July 1970, landslide and floods took place in the upstream areas of the Alaknanda river flowing through the Garhwal region. Such large-scale mass-wasting events are not unexpected in the Himalaya, especially in the monsoon months. The widespread land slides and floods in the Alaknanda watershed, however, generated a public opinion that these events were caused by deforestation in the region that was accelerated by commercial felling by the contractors who were given felling permits by the Forest Department. Thus, a feeling of stewardship of the local forests for ensuring environmental stability in the region germinated in the minds of the local people as a perceived precautionary measure. Slowly but steadily, the environmental damages from landslides and floods became a strong public justification

for the social demand for ending the role of external contractors in commercial extraction of the forests in favour of the small-scale extraction by the small industries in the villages. It is at this stage that the latent conflict of interests between the local village organizations and the forest contractors from distant cities started to be voiced openly. In the period 1970–1973 villagers perceived as related the commercial felling of trees by external contractors and the threat to their lives from the massive landslides and floods in the region, strengthening the popular demand for stopping the external contractor system. Obstruction to the contractors was made in 1973 in Mandal. Mishra and Tripathi (1978) have given a detailed account of this accumulation of public grievances against the practice of forest felling by the contractors.

3.2.4 Social Innovation for Forest Rights

On 26 March 1974, one of many such latent popular disapproval expressed itself as an open non-violent action of resistance to tree felling by external contractors by the people in village Reni located in the Alaknanda watershed. The nearby *Dasholi Gram Swarajya Sangh* was first given allocation of 12 Ash trees in the forest near the village Reni, for making agricultural implements. The allocation was unilaterally withdrawn by the Forest Department who cited environmental conservation as the reason (Joshi 1982). At the same time, a sports good manufacturer from the far away city of Allahabad was allocated 32 Ash trees from the same forest area. There was serious popular opposition to this decision. On that day the men of the village Reni had gone to the Forest Department office some distance away, to discuss the dispute over allocation of trees for felling. At the same time the contractor of the sports goods company from Allahabad sent tree loggers to the forests near Reni to fell the trees already marked. At this time as the men of Reni village were away taking part in a meeting at the forest office only women were present in the village. The elderly lady of the village, Gaura Devi, quickly assembled a group of 29 women and decided to oppose the felling by entering the forest and reaching the site where stood the trees marked for felling. They marched to the spot in the forest with determination and in a non-violent manner. This was the beginning of an innovative non-violent intervention of the villagers who saw small scale commercial extraction of the local forests by local people as an option for sustaining the local environment and livelihoods at the village level. Considering the traditional political influence of the forest contractors in the remote villages, this marching of village women from Reni to the forest area and their determination to resist felling by the contractor's axemen was an innovation in courage. It made the loggers from distant cities unsure of whether to accept a confrontation or retreat. After a lot of verbal exchanges the axemen decided to avoid confrontation and moved out of the forest. The women of Reni, till then, did not quite perceive that in addition to creating a finale of the emerging conflicts over forest felling in Uttarakhand, they had just laid the innovative foundation of a movement for sustainable extraction of the Himalayan forests,

that later became globally celebrated in the years to follow as the *Chipko* movement (Bandyopadhyay 2004; Joshi 1982).

The news of the success of this innovative idea of village women of Reni in resisting felling by the contractors' men quickly spread all over Uttarakhand. Very soon this innovation got replicated in other areas by both men and women. The latter constituted the main force of the resistance as many male members of the village had moved to distant cities for employment. Thus was born the people's movement in Uttarakhand against non-local forest contractors. It demanded greater role of the village organizations in commercial extraction of local forests and soon became known by the name *Chipko* which literally means 'Hugging' the trees. The local protesters told the contractors that they would hold on to the trees to prevent them from felling by the external contractors. The spirit of the movement is expressed through a compelling couplet in the local *Garhwali* language written during the movement by the folk poet and activist Ghanshyam Sailani:

Chipka dalion par janglu bachonda
Paharon ka sampatti ab na loothenda

meaning: Hug the trees to protect forests from felling
Stop the loot of the property of the mountains

The innovative action by the women of Reni village by marching in large numbers to the forest area led to the creation of a non-violent people's movement in Uttarakhand, which forced a change in governmental policy on the extraction of forests in the mountainous parts of the state. The *Chipko* movement wanted a greater role of the village communities in the extraction and conservation of local forests of Uttarakhand. The movement ignited popular aspirations for livelihoods based on small-scale extraction of the forests. The government of the State of Uttar Pradesh, to which the area of the present State of Uttarakhand then belonged to, in 1975 agreed to bring to an end the contract system of felling of the Himalayan forests. There was also a greater role of the village communities in the process of forest felling. Over the years, this movement inspired environmental groups in India as well as many other countries. The idea that non-violent resistance in the form of hugging trees to be cut down constituted the other part of the social innovation. While the movement got its name from the popular commitment to hug trees if needed, to protect them from felling by the axe men of the forest contractors, the recorded history of the movement over the last 41 years brings out that hugging was resorted to only once on 8 January 1978. Courageous Gandhian social activist Dhoom Singh Negi accompanied by friend Hukam Singh Negi, both of Pipleth village stopped felling by resorting to hugging trees at Salet forest in Tehri Garhwal. *Chipko* movement grew out of the popular resistance against the monopoly on commercial extraction of the forests enjoyed by rich contractors from distant cities and in favour of a greater role of the village communities in commercial green felling, extraction of Pine saps, etc. In other instances of resistance, the presence of large number of agitated and slogan shouting villagers in the forest areas was enough to discourage the contractors.

The movement has been the subject of hundreds of books and articles as well as many doctoral dissertations. However, many of these publications have probably

been based on subjective accounts and, thus, created significant distortions in the public image of the movement. It was Guha 1990 who drew the important distinction between the local reality of *Chipko* as a 'quentessential peasants' movement' of village communities over access to forest products and its global image as a celebrated environmental conservation movement.

3.2.4.1 Judicial Innovation for Sustainable Environment

The issue of environmental sustainability has been a matter of sincere interest to the Indian Judiciary, in particular the Supreme Court of India. Over the last three decades, the Court has taken great interest in introducing a number of innovative measures in resolving environmental conflicts and litigations. These pioneering innovations by the Indian judiciary have also been emulated in many other countries. Some of these innovative measures include: taking suo moto action against polluters; entertaining petitions on behalf of parties and inanimate objects (such as nature and wildlife, which cannot file litigation themselves) affected by environmental damages like pollution; expanding the sphere of litigation; and introducing environmental principles such as the principle of 'polluters pay', the precautionary principle, absolute liability and the public trust doctrine, etc. These measures were mainly aimed at environmental safety and protection in a general framework for advancing the well-being of the people.

Undoubtedly, the most important of such judicial innovations was the introduction of the process of Public Interest Litigation (PIL). Until the early 1970s, litigation in India was in its rudimentary stage because it was seen as a pursuit for the vindication of private vested interests. During this phase, the initiation and pursuance of litigation rested entirely with the aggrieved individual. The traditional rule in regard to *locus standi* is that judicial redress is available only to a person who has suffered a legal injury by reason of violation of his legal right or legal protected interest by the impugned action of the State or a public authority or any other person or who is likely to suffer a legal injury by reason of threatened violation of his legal right or legally protected interest by any such action. It was in the case of Maharaj Singh v. State of Uttar Pradesh & Others (AIR 1976 SC 2602), Justice V R Krishna Iyer observed that "Where a wrong against community interest is done, 'no *locus standi*' will not always be a plea to non-suit an interested public body chasing the wrongdoer in court". Similarly, in the case of S.P. Gupta v. President Of India And Others (AIR 1982 SC 149) the Court under the leadership of Justice P N Bhagwati observed that

> *where a legal wrong or a legal injury is caused to a person or to a determinate class of persons by reason of violation of any constitutional or legal right or any burden is imposed in contravention of any constitutional or legal provision or without authority of law or any such legal wrong or legal injury or illegal burden is threatened and such person or determinate class of persons is by reason of poverty, helplessness or disability or socially or economically disadvantaged position, unable to approach the Court for relief, any member of the public can maintain an application for an appropriate direction, order or writ in the*

High Court under Article 226 and in case of breach of any fundamental right of such person or determinate class of persons, in this Court under Article 32 seeking judicial redress for the legal wrong or injury caused to such person or determinate class of persons

A complete change in the Indian jurisprudence scenario was observed in the 1970s, with the efforts made by Justice P N Bhagwati and Justice V R Krishna Iyer. The introduction of the system of PIL is the judicial innovation that has emerged as a very important tool, especially for the poor in seeking justice. In many subsequent cases, the Supreme Court described the concept of PIL as an important instrument to bring justice to the doorsteps of poor and weaker sections of the society.

The Court started to entertain PIL for environmental protection in early 1980s and over the last three decades PIL has been an important instrument for environmental groups to protect the rights of the inanimate objects and rights of people affected by environmental insecurity in many significant ways. First, prior to the emergence of the concept of PIL, Criminal Law provisions as contained in the Indian Penal Code, Civil Law remedies under the law of Torts and provisions of the Criminal Procedure Code were the main legal tools for providing remedies in respect of public nuisance cases, including air, water and noise pollution. Due to the general lack of people's awareness about environmental laws, there were problems in drawing the attention of the Court to bring relief from environmental damages. Moreover, there was no provision in the environmental legal framework for allowing the third party to seek the intervention of the Court, if the party concerned was not directly affected by environmental problems (Curmally 2002). Hence, the biggest hurdle in the path of litigation for seeking environmental justice was the traditional concept of *locus standi*. Earlier, when a petitioner approached the appellate Court for seeking relief in respect of an injury he did not suffer directly, the case was not maintainable, as the appellate Court would invariably focus with the status of the petitioner rather than the subject of petition. However, now the judicial approach has changed in that any member of the public having a genuine interest may be allowed to initiate the legal process with a view to asserting diffused and meta-individual rights. Generally, in the context of environmental litigation, the parties affected are a large, diffused and unidentified group of people. Therefore, the question is who ought to bring such cases to the Court's notice wherein no personal injury, in particular, has been noticed. In such situations, the Court has emphasized that any member of the public having a sufficient interest may be allowed to initiate the legal process in order to assert diffused and meta-individual rights related to environmental problems.[1]

A number of cases related to environmental issues initiated through PIL have been brought to the Court's attention beginning with the limestone quarrying case[2] in Doon Valley in Uttarakhand in 1983 (Bandyopadhyay 1989). This trendsetting litigation resulted in the relief to the rural population in the valley and residents of the city of Dehradun from impacts of open cast limestone quarrying in the hilly parts of the

[1] RLEK v. State of Uttar Pradesh and Others, Supreme Court of India, AIR 1985 SC 652.

[2] The Dehradun lime stone quarries litigation filed by the Rural Litigation and Entitlement Kendra in 1983 was the first PIL case filed in the Supreme Court related to environmental issue in the country.

Valley. It also opened up the path for drawing the attention of the judiciary to almost all major issues of environmental degradation in the country. The Doon Valley case was followed by the Ganga Water Pollution case, Delhi Vehicular Pollution case, Oleum Gas Leak case, environmental risks of the Tehri high dam case, Sardar Sarovar Dam case, coastal management case, industrial pollution in Patencheru, T.N. Godavarman case, among many others. These cases had been initiated by non-governmental organizations (NGOs) and environmental activists on behalf of other individuals and groups or the public at large with a view to seeking the implementation of statutory acts and constitutional provisions aimed at the protection of the environment from human induced damages and enforcement of fundamental rights. It has been found from the Supreme Court Case Reports that out of 221 environmental cases brought before the Court from 1980 to 2010, 84 had been filed by individuals not directly affected by any of the above-mentioned cases, while 39 by Organizations on behalf of the affected parties. This suggests that the innovation of the instrument of PIL as an effective legal option has provided an immense opportunity to the third party to represent the affected people and the natural environment itself.

The Court also has gone a step ahead in expanding the sphere of its orders and directions to protect and improve the environment. For example, in the case of MC Mehta v. Union of India and Others (AIR 1988 SC 1037), Mehta filed a petition before this Court complaining that neither the Government nor the people were giving adequate attention to stop the pollution of river Ganga, India's most important and revered river. It was, therefore, necessary to take steps for the purpose of protecting the cleanliness of the river Ganga and sought the issue of a writ/order/direction in the nature of mandamus to the respondents restraining them from letting out the trade effluents into the river Ganga till such time they put necessary treatment plants for treating the trade effluents in order to arrest the pollution. The Court, however, directed issue of notice under order 1 Rule 8 of the Code of Civil Procedure treating the case as a representative action by publishing the gist of the petition in the newspapers in circulation in northern India and calling upon industrialists and the municipal corporations and town municipal councils having jurisdiction over the areas through which the river Ganga flows, to appear before the Court to show cause as to why direction should not be issued as prayed for by the petitioner asking them not to allow trade effluents and sewage into the river Ganga without appropriately treating them before discharging. In this case, the petition was filed against the Kanpur tanneries and Kanpur Municipal Council to stop polluting the river Ganga. But the Court had asked all the industrialists and the Municipal Corporations and the town Municipal Councils with areas coming under their jurisdiction to appear before the Court. Similarly, in 1995, TN Godavarman Thirumulpad filed a writ petition in the Supreme Court of India for protecting the Nilgiris forest land from deforestation through illegal timber operations.[3] The Court while hearing the Godavarman case extended its scope, i.e. preventing illegal operations in one forest to include the reformation of the country's general forest policy.

[3] T. N. Godavarman v. Union of India, Supreme Court of India, Judgment of 12 December 1996, AIR 1997 SC 1228.

The positive impact of the Court's approach to environmental litigations through third-party representation has dramatically transformed the form and substance of environmental jurisprudence in India. Taking recourse to judicial intervention for justice can prove to be a costly exercise for those who have already experienced substantial losses from environmental damages. Even if the aggrieved party takes recourse to judicial intervention, the Court might only settle the disputes between the appellant party and the parties responsible for environmental damages, while there is every possibility of the rights of other aggrieved persons remaining unsettled. Judicial remedies for environmental maladies could lead to effective results if the remedies benefit also those who are not a party to the litigation process. By entertaining petitions filed on behalf of the poor and the disadvantaged sections of the society, the Court has attempted to uphold the rights of people in terms of deciding compensation and providing other remedies to the affected people. Allowing a third party to bring environmental problems to the Court's notice has also an important bearing on inanimate objects, which cannot represent themselves in the litigation process. Hence, it is important that the state of the inanimate objects is represented by NGOs and environmental activists through the instrument of PIL. Thus, the rationale underlying PIL is that it is the responsibility of the polluter to pay a price for the damage he has done to the natural objects and thereby restore the environment to its natural state.[4]

More recently, the Supreme Court of India has taken another innovative step, by establishing the National Green Tribunal (NGT) in 2010 under the National Green Tribunal Act 2010. This was done for effective and expeditious disposal of cases related to environment. The NGT is expected to dispose of the cases within a period of six months. While the judiciary ensures the rule of law, the law can be reviewed, changed or replaced by the Parliament. In this regard, another form of prospective innovation may be in the offing in India. The appointment of the High Level Committee (HLC) to review the various Environmental Acts is another innovation that has caught the public attention. The HLC submitted its Report in November 2014. Commenting on the Report of the HLC, Iyer (2015) observed that "the HLC has produced a hasty, half-baked, inadequately thought-through report. If accepted by the government and implemented, it will have serious adverse consequences. The report needs to be totally rejected." Many critics see this outcome favourably, as a step counter to the earlier innovations that may go against environmental sustainability. Many see it as an attempt of the governmental growth fundamentalism to undo what the PILs have been working for. This brings us to the end of recent most innovation in environmental sustainability in India. It also concludes a long history of ups and downs in social innovations related to environmental sustainability in India over a period of about 5000 years.

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[4] Indian Council for Enviro-Legal Action v. Union of India (Bichhri village industrial pollution case), Supreme Court of India, Judgment of 13 February 1996, 1996 (3) SCC 212.

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