Mobilizing the Public Trust Doctrine in Support of Publicly Owned Forests as Carbon Dioxide Sinks in India and the United States

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I. INTRODUCTION

The ecological value of forests as carbon dioxide ("CO_2") sinks has been thrown into sharp relief by the emergence of anthropogenic climate change as a serious threat to the stability of ecosystems and the human societies that depend on them worldwide.[1] Anthropogenic climate change is related to the "greenhouse effect," the physics of which are relatively simple and well understood. Gases in the Earth's atmosphere, including but not limited to CO_2, trap energy from the Sun that the Earth otherwise would radiate into space, thus both warming the planet sufficiently to support life and creating the long-term patterns of meteorological phenomena that we know as climate.[2] In 1896, Swedish scientist Svante Arrhenius predicted that anthropogenic emissions of CO_2—at the time mostly from the burning of coal—would cause global temperatures to rise over time by magnifying this effect.[3] Few scientists were interested in his prediction then, or for many decades thereafter.[4]

The modern era of climate change research began in the 1960s, after American scientist Charles David Keeling detected a steady annual increase in average atmospheric CO_2 concentrations using advanced instrumentation unavailable to previous generations of scientists.[5] By the 1980s, studies of the CO_2 content of prehistoric air bubbles trapped in Antarctic and Greenland ice cores made clear that global temperatures rise and fall with atmospheric concentrations of CO_2,[6] and that the CO_2 concentrations in the air above the ice from which the Antarctic cores were drilled were far above prehistoric levels.[7] Since then, hundreds, if

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1. A CO2 sink is any process, activity, or mechanism that removes CO2 from the atmosphere. *See* Annex II: Glossary (Alfons P. M. Baede, Paul van der Linden & Aviel Verbruggen, eds.) to INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT. CONTRIBUTIONS OF WORKING GROUPS I, II AND III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 76, 86 (Core Writing Team, R. K. Pachauri & A. Reisinger, eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf (defining "sink" in the context of greenhouse gases and aerosols).

2. *See* SPENCER R. WEART, THE DISCOVERY OF GLOBAL WARMING 2–4 (rev. ed., 2008).

3. *Id.* at 5–7.

4. *Cf. id.* at 7–19 (recounting the response of scientists to Arrhenius's prediction and the history of climatology from the late nineteenth through the mid-twentieth centuries).

5. *See id.* at 20–21, 25, 35–38.

6. *Id.* at 130–31, 138–39.

7. SPENCER WEART, *The Carbon Dioxide Greenhouse Effect*, in THE DISCOVERY OF GLOBAL WARMING, at text accompanying note 53 (2009), http://www.aip.org/history/climate/co2.htm (supplementing in hypertext SPENCER R. WEART, THE DISCOVERY OF GLOBAL WARMING (rev. ed., 2008)). Atmospheric CO2

not thousands, of peer-reviewed scientific studies have confirmed the speed and scope of the global warming that is disrupting the Earth's climate,[8] and the role of human activities, especially the combustion of fossil fuels, in causing it.[9] The Intergovernmental Panel on Climate Change ("IPCC") has concluded based on its synthesis of these studies that an increase in global annual average temperatures of more than two degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels would cause many climate impacts that an IPCC chair has described as "devastating," and that limiting the increase to two degrees Celsius would require a reduction in global CO_2 emissions of fifty percent below 1990 levels by 2050.[10] In 2007, the IPCC won a Nobel Prize for its work.[11]

The United States was the world's largest emitter of CO_2 until 2006, when the People's Republic of China ("P.R.C.") surpassed it.[12] Together, the European Union, the United States, and the P.R.C. currently account for almost sixty percent of annual global CO_2 emissions,[13] with the

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concentrations are far higher now than they have been at any time in the past 650,000 years. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT. CONTRIBUTIONS OF WORKING GROUPS I, II AND III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 37 (Core Writing Team, R. K. Pachauri & A. Reisinger, eds., 2007), http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html [hereinafter IPCC 2007 SYNTHESIS REPORT].

8. More than 900 climate change studies were published in peer-reviewed scientific journals between 1993 and 2003 alone. Naomi Oreskes, *The Scientific Consensus on Climate Change*, 306 SCIENCE 1686 (2004). For their implications, see *infra* note 10 and accompanying text.

9. The combustion of fossil fuels accounts for more than half of the global warming potential of global annual anthropogenic GHG emissions. See IPCC 2007 SYNTHESIS REPORT, *supra* note 7, at 36 fig.2.1.

10. Eric J. Lyman, *Climate* Change: Next IPCC Report to Add 'Astonishing Level' of Detail on Climate Issues, Panel Chair Says, 32 INT'L ENV'T REP. 670 (2009). The IPCC was established by the World Meteorological Organization and the United Nations Environmental Programme in 1988 to "assess scientific information related to climate change, to evaluate the environmental and socio-economic consequences of climate change, and to formulate realistic response strategies." Michel Jarraud & Achim Steiner, Foreword to IPCC 2007 SYNTHESIS REPORT iii, supra note 7. More than 500 lead authors and 2000 expert reviewers participated in the preparation of the IPCC's most recent assessment, which was released in 2007. *Id.*

11. Mike Ferullo, *Climate Change: Gore, U.N. Share Nobel Peace Prize for Raising Awareness of Global Warming*, 30 INT'L ENV'T REP. 822 (2007).

12. Press Release, Netherlands Environmental Assessment Agency, Chinese CO2 Emissions in Perspective (June 22, 2007), http://www.pbl.nl/en/news/pressreleases/2007/20070622ChineseCO2emissionsinperspective.html.

13. WORLD BANK, WORLD DEVELOPMENT REPORT 2010: DEVELOPMENT AND CLIMATE CHANGE, at 202 box 4.4 (2009), *available at*

United States' share standing at about twenty percent.[14] Although India currently accounts for only four percent of annual global CO_2 emissions, its projected contribution would grow to twelve percent by 2050 without any mitigation policy in place.[15]

The world's forests, which function as CO_2 sinks, mitigate the adverse environmental impacts of these emissions. These forests store 289 gigatons ("Gt") of carbon in their biomass alone,[16] which is nearly twenty-eight times the amount of carbon in the 38 Gt of anthropogenic CO_2 emitted globally in 2004, the last year included in the IPCC's most recent synthesis report.[17] Since 2005, however, the carbon stored in forest biomass worldwide has decreased by about 0.5 Gt per year, mostly because of deforestation.[18] Moreover, total anthropogenic greenhouse gas ("GHG") emissions from the forestry sector, including CO_2 emissions from deforestation, account for more than seventeen percent of the global warming potential of annual GHG emissions worldwide.[19] The IPCC considers the reduction of GHG emissions from deforestation through

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http://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1226014527953/WDR10-Full-Text.pdf.

14. *Cf.* U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, REP. NO.DOE/EIA-0573(2008), EMISSIONS OF GREENHOUSE GASES IN THE UNITED STATES 2008, at 7 (2009), *available at* http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/0573%282008%29.pdf (reporting in relevant part on energy-related CO2 emissions only).

15. WORLD BANK, *supra* note 13, at 202 box 4.4. For an analysis of GHG emissions trends in India, see Subodh Sharma, Sumana Bhattacharya & Amit Garg, *Greenhouse Gas Emissions from India: A Perspective,* 90 CURRENT SCI. 326 (2006). For the most recent United Nations comparison of total CO2 emissions from more than 200 countries and related political units, see U.N. Statistics Division, Millennium Development Goals Indicators -- Carbon Dioxide Emissions (CO2), Thousand Metric Tons of CO2 (CDIAC), http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid (last visited Oct. 2, 2011) [hereinafter U.N. Millennium Development Goals Indicators].

16. Food and Agriculture Organization of the United Nations ("FAO"), GLOBAL FOREST RESOURCES ASSESSMENT 2010: KEY FINDINGS, at 4 (2010), available at http://foris.fao.org/static/data/fra2010/KeyFindings-en.pdf [hereinafter FAO FOREST ASSESSMENT KEY FINDINGS]. Internationally, CO2 emissions are measured in metric tons, not Anglo-American tons. Mt CO2e - Metric Tonne Carbon Dioxide Equivalent, http://mtco2e.com/ (last visited Oct. 2, 2011). One metric ton of carbon is equivalent to approximately 3.67 metric tons of CO2. See id. Forests also store carbon in their soil. See, e.g., FAO FORESTRY DEPARTMENT, GLOBAL FOREST RESOURCES COUNTRY REPORT: UNITED STATES OF AMERICA, at 42 § 8.2.2, 43 § 8.4, FAO Doc. FRA2010/223, (2010), *available at* http://www.fao.org/forestry/20472-07ef217be8cc051b2772b2d01fd5a3535.pdf [hereinafter FAO U.S. FOREST RESOURCES REPORT].

17. *Cf.* IPCC 2007 SYNTHESIS REPORT, *supra* note 7, at 36 (reporting total global CO2 emissions in 2004 in Gt).

18. FAO FOREST ASSESSMENT KEY FINDINGS, *supra* note 16, at 4.

19. *See* IPCC 2007 SYNTHESIS REPORT, *supra* note 7, at 36 fig.2.1.

forest conservation and sustainable management practices to be an important part of any global climate change mitigation strategy.[20] The Thirteenth Conference of the Parties to the United Nations Framework Convention on Climate Change, which met in Bali in December 2007,[21] underscored this importance by establishing a program to encourage both developed and developing country parties to work together to reduce GHG emissions from deforestation and forest degradation in developing countries.[22]

At 304 million hectares ("ha") (1.17 million square miles ("mi^2")), U.S. forests are the fourth largest in the world.[23] India's forests, at 68 million ha (263,000 mi^2), are the tenth largest.[24] U.S. forests currently store more than 19.3 Gt of carbon in their living biomass alone,[25] which

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20. *See, e.g., id*. at 62 tbl.4.3.

21. For the official account of the Thirteenth Conference of the Parties, see United Nations Framework Convention on Climate Change, The United Nations Climate Change Conference in Bali, http://unfccc.int/meetings/cop_13/items/4049.php (last visited Oct. 18, 2011).

22. *See Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action*, Decision 2/CP.13, in *U.N. Framework Convention on Climate Change Conference of the Parties,* Dec. 3–15, 2007, *Report of the Conference of the Parties on Its Thirteenth Session*, *Held in Bali from 3 to 15 December 2007 Addendum Part Two: Action Taken by the Conference of the Parties at Its Thirteenth Session*, at 8, FCCC/CP/2007/6/Add.1* (2008), *available at* http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=8. This program is known as REDD. For the official account of REDD's status, *see* United Nations Framework Convention on Climate Change, REDD Web Platform, http://unfccc.int/methods_science/redd/items/4531.php (last visited Jan. 25, 2011).

23. *See* FAO, GLOBAL FOREST RESOURCES ASSESSMENT 2010: MAIN REPORT, at 13 fig.2.2 (2010), *available at* http://foris.fao.org/static/data/fra2010/FRA2010_Report_en_WEB.pdf [hereinafter FAO 2010 FOREST ASSESSMENT MAIN REPORT]. Only the Russian Federation (809 million ha or 3 million mi2), Brazil (520 million ha or 2 million mi2), and Canada (310 million ha or 1.2 million mi2) have more forested land than the United States does. *See id*.; *see also* FAO, GLOBAL FOREST RESOURCES ASSESSMENT 2010: GLOBAL TABLES, at tab 2 (2010)(listing the extent of forest and other wooded land in 2010 for 252 countries and other areas), *available at* http://www.fao.org/forestry/fra/fra2010/en/ [hereinafter FAO 2010 FOREST ASSESSMENT GLOBAL TABLES].

24. *See* FAO 2010 FOREST ASSESSMENT MAIN REPORT, *supra* note 23, at 13 fig.2.2. In addition to the Russian Federation, Brazil, Canada, and the United States, only the P.R.C. (207 million ha or 799,000 mi2), the Democratic Republic of the Congo (154 million ha or 595,000 mi2), Australia (149 million ha or 575,000 mi2), Indonesia (94 million ha or 363,000 mi2), and Sudan (70 million ha or 270,000 mi2) have more forested land than India does. *See id*.; see also FAO 2010 FOREST ASSESSMENT GLOBAL TABLES, supra note 23, at tab 2 (listing the extent of forest and other wooded land in 2010 for 252 countries and other areas).

25. *See* FAO U.S. FOREST RESOURCES REPORT, *supra* note 16, at 42 § 8.2.2, 43 § 8.4. Forests also store carbon in their dead woody biomass (e.g., standing dead trees),

is more than twelve times the amount of carbon in the 5.8 Gt of CO_2 emitted annually by the United States in recent years.[26] India's forests currently store more than 2.8 Gt of carbon in their living biomass,[27] which is more than six times the amount of carbon in the 1.6 Gt of CO_2 emitted annually by India.[28] In the United States, only forty-three percent of forested land is publicly owned (131 million ha or 500,000 mi^2),[29] whereas in India the total stands at eight-six percent (58 million ha or 226,000 mi^2).[30] All publicly owned forests in the United States are managed by federal, state, county, or municipal governments.[31] The 76,292,000 ha (292,000 mi^2) National Forest System, managed by the U.S. Forest Service within the U.S. Department of Agriculture, comprises nearly sixty percent of the total.[32] In India, State Governments manage almost two-thirds of publicly owned forests,[33] with the rest being

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their "litter" (e.g., fallen leaves) and other small non-living biomass lying on the ground, and their soil. See, e.g., id.

26. *Cf.* U.N. Millennium Development Goals Indicators, *supra* note 15 (reporting U.S. CO2 emissions in 2007 in thousands of metric tons for purposes of assessing progress toward achieving the United Nations Millennium Development Goal of ensuring environmental sustainability).

27. *See* FAO FORESTRY DEP'T, GLOBAL FOREST RESOURCES COUNTRY REPORT: INDIA, at 35 §§ 8.4-.5 (FAO Doc. FRA2010/094) (2010), *available at* http://www.fao.org/forestry/20349-0d6aad0b1848bf82895842fe7bad58b4b.pdf [hereinafter FAO INDIA FOREST RESOURCES REPORT].

28. *Cf.* U.N. Millennium Development Goals Indicators, *supra* note 15 (reporting India's CO2 emissions in 2007 in thousands of metric tons for purposes of assessing progress toward achieving the United Nations Millennium Development Goal of ensuring environmental sustainability).

29. *See* FAO U.S. FOREST RESOURCES REPORT, *supra* note 16, at 15 § 2.4 tbl.2a. The percentage of U.S. forests in public ownership varies widely by region. Two-thirds of forested land in the Western continental United States is publicly owned, managed mostly by federal agencies such as the U.S. Forest Service (Department of Agriculture), the Bureau of Land Management (Department of the Interior ("DOI")), and the National Park Service (DOI), whereas less than twenty percent of Eastern forests are. See Mark D. Nelson & Greg C. Liknes, Forest Service, U.S. Dep't of Agric. *Forest Land Ownership in the Coterminous United States*, in 22 ESRI MAP BOOK 76 (M. Law, ed., 2007), *available at* http://www.nrs.fs.fed.us/pubs/maps/map497_pg76.pdf.

30. FAO INDIA FOREST RESOURCES REPORT, *supra* note 27, at 13 § 2.3.2. Eighty percent of forests are publicly owned worldwide. FAO 2010 FOREST ASSESSMENT KEY FINDINGS, *supra* note 16, at 10.

31. FAO INDIA FOREST RESOURCES REPORT, *supra* note 16, at 15 §§ 2.4 tbl.2b, 2.5.

32. *Compare* CONG. RESEARCH SERV., CRS REPORT 95-599 ENR, MAJOR FEDERAL LAND MANAGEMENT AGENCIES: MANAGEMENT OF OUR NATION'S LANDS AND RESOURCES, at text accompanying note 10 (1995), available at http://www.cnie.org/nle/crsreports/natural/nrgen-3.cfm (specifying the size of the National Forest System), with FAO INDIA FOREST RESOURCES REPORT, supra note 16, at 15 § 2.4 tbl.2a (tabulating the forest area in public ownership in the United States).

33. *See* FAO INDIA FOREST RESOURCES REPORT, supra note 27, at 11 § 2.1, 14 § 2.4

managed jointly by the State Governments and local communities.[34] The Union Government imposes numerous statutory and regulatory constraints on the management of all publicly owned forests.[35]

As publicly owned natural resources, the 189,000,000 ha (726,000 mi^2) of publicly owned forests in India and the United States are potentially subject to the public trust doctrine. This article explores the public trust doctrine as a strategy for supporting the role of these forests as CO_2 sinks in both jurisdictions.[36] Part I briefly recounts the origin and theory of the public trust doctrine. Part II summarizes the content and sources of its American variants. Part III does the same with respect to the Indian version. Part IV examines the status of publicly owned forests as public trust resources in both jurisdictions. Part V does the same with respect to the status of CO_2 sequestration as a protected public use. This article concludes by arguing that precedents exist in both India and the United States for many of the essential elements of a public trust cause of action in support of publicly owned forests as CO_2 sinks, although India probably offers a more fertile field for realizing their full potential, at least in the near term.

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tbl.2b.

34. *See id.* at 14 §§ 2.4 tbl.2b, 2.5. For a comprehensive exploration of the evolution and impact of joint forest management in six Indian States, see N. H. RAVINDRANATH & P. SUDHA, JOINT FOREST MANAGEMENT IN INDIA: SPREAD, PERFORMANCE AND IMPACT (2004).

35. *See generally* Forest (Conservation) Act, 1980 with Amendments Made in 1988, *available at* http://envfor.nic.in/legis/forest/forest2.html; The Indian Forest Act, 1927, *available at* http://envfor.nic.in/legis/forest/forest4.html; Forest (Conservation) Rules, 2003, Gazette of India, Part II — Section 3 — Sub-section (i), Jan. 10, 2003, *available at* http://www.envfor.nic.in/legis/forest/gsr23%28e%29.htm; Ministry Env't & Forests, Gov't of India, MEF Guideline No. 5-5/86-FC, Guidelines for Diversion of Forest Lands for Non-Forest Purpose Under the Forest (Conservation) Act, 1980 (Nov. 25, 1994), *available at* http://www.envfor.nic.in/legis/forest/forguide.html. Although the management of forests by the State Governments preceded Indian independence, see generally The Indian Forest Act, 1927, supra, the Indian Constitution gives both Parliament and the state legislatures the power to legislate with respect to forests, INDIA CONST. art. 246, § 1, List III-17A. Parliamentary legislation prevails over that of the States when the two conflict, except in very narrowly defined circumstances. *See id.* art. 254.

36. Narrower questions, such as the potential use of the public trust doctrine by the state or anyone else to recover natural resource damages from private parties for impairing the ability of privately owned forests to function as CO2 sinks, are beyond the scope of this article, except insofar as judicial decisions on those questions have established that the public trust doctrine applies to forests. Cf. Puerto Rico v. SS Zoe Colocotroni, 456 F. Supp. 1327 (D.P.R. 1978), *aff'd in part and vacated in part on other grounds*, 628 F.2d 652 (1980) (holding that the public trust doctrine applies to mangroves in an action by governmental authorities to recover the value of damage to those forests by an intentional release of crude oil from a grounded oil tanker in coastal waters).

II. ORIGIN AND THEORY OF THE PUBLIC TRUST DOCTRINE

The public trust doctrine is an invention of the English common law, but with roots in the Roman civil law's concept of *res communis*.[37] In the sixth century C.E., the *Institutes of Justinian* restated the Roman rule as follows: "By the law of nature these things are common to mankind—the air, running water, the sea, and consequently the shores of the sea."[38] The public acquired certain usufructuary rights in these resources by virtue of its common property interest in them. For example, all rivers and ports were public such that everyone had a right to fish in them.[39] Everyone also had the right to approach the seashore provided that habitations, monuments, and buildings were respected;[40] to build a cottage on the seashore; to haul nets to the shore from the sea; and to dry them there.[41] Finally, everyone had a right to navigate rivers, to bring vessels to their banks and to tie them to trees growing there, and to deposit the vessels' cargo on the banks, even though the banks and trees were the property of the riparian landowners.[42] The state apparently protected the uses to which the *res communis* concept applied, although there is no evidence that the Roman public could enforce its right against the state to these uses.[43]

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37. *See* Joseph L. Sax, *Liberating the Public Trust Doctrine from Its Historical Shackles,* 14 U.C. DAVIS L. REV. 185, 185 (1980) [hereinafter Sax 1980]; cf. Carl Bruch, Wole Coker & Chris Van Arsdale, *Constitutional Environmental Law: Giving Force to Fundamental Principles in Africa,* 26 COLUM. J. ENVTL. L. 131, 159–60 (2001) ("The [public trust] doctrine dates back to the Institutes of Justinian (530 A.D.), which restated Roman Law . . . . In the centuries since then, both civil law and common law countries have incorporated these principles . . . .").

38. J. INST. 2.1.1 (Thomas Collett Sandars trans., 1876).

39. *Id.* 2.1.2. Strictly speaking, this rule illustrates the Roman concept of res publicum—or public property—which overlapped and reinforced the concept of res communis—or common property. See Donna Jalbert Patalano, *Police Power and the Public Trust: Prescriptive Zoning Through the Conflation of Two Ancient Doctrines*, 28 B.C. ENVTL. AFF. L. REV. 683, 703–04 (2001) (exploring the distinctions among *res publicum, res communis*, other categories of Roman property (*res*), and related rights (*jus*)).

40. *See* J. INST. 2.1.1 (Thomas Collett Sandars trans., 1876).

41. *Id.* 2.1.5. According to the Roman law, the seashore extended to the high-water mark, as measured by the highest winter flood. *Id.* 2.1.3.

42. *Id.* 2.1.4.

43. Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 475 (1970) [hereinafter Sax 1970]; cf. Richard Perruso, *The Development of the Doctrine of Res Communes in Medieval and Early Modern Europe*, 70 LEGAL HIST. REV. 69, 70 (2002) (noting the right to seek redress against a private party for interference with the public right of access to *res*

By the thirteenth century, the English common law had absorbed the Roman concept, but added to it the idea that the Crown owned the property in question, at least insofar as it was comprised of the beds of navigable waters.[44] Bracton restated the English rule as follows:

> By natural law, these are common to all: running water, air, the sea, and the shores of the sea, as though accessories of the sea. No one therefore is forbidden access to the seashore, provided he keeps away from houses and buildings [built there] . . . .
>
> All rivers and ports are public, so that the right to fish therein is common to all persons. The use of river banks, as of the river itself, is also public . . . [and] consequently everyone is free to moor ships to them, to fasten ropes to the trees growing there and to land cargoes upon them, just as he is free to navigate the river itself.[45]

Moreover, the common law prohibited the Crown from alienating these lands. As Bracton restated the rule, "A thing belonging to the fisc is . . . *quasi*-sacred and cannot be given or sold or transferred to another by the prince or reigning king; such things constitute the [C]rown itself and concern the common welfare."[46] The common law thus transformed the Roman concept of common property to which the public had certain usufructuary rights into an English concept of a public trust that prohibited the Crown from alienating royal lands so as to impair certain types of public uses of them.[47]

Despite the later spread of the English common law tradition throughout the British Empire,[48] few former British colonies have embraced the common law public trust doctrine with much enthusiasm,[49]

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communis).

44. Jan S. Stevens, *The Public Trust: A Sovereign's Ancient Prerogative Becomes the Public's Environmental Right*, 14 U.C. DAVIS L. REV. 195, 197–98 (1980).

45. 2 HENRY DE BRACTON, ON THE LAWS AND CUSTOMS OF ENGLAND 39–40 (Samuel E. Thorne trans., Belknap Press 1968) (1922) (including bracketed material in original).

46. *Id.* at 58 (including bracketed material in original); see also LOUIS HOUCK, A TREATISE ON THE LAW OF NAVIGABLE RIVERS 16–17 § 28 (1868) (offering an alternative translation of and commentary on this passage, from Bracton, lib. 1, cap. 12, § 6, which Houck translates as "all things which relate peculiarly to the public good cannot be given over or transferred by the king to another person, or separated from the Crown"); cf. Stevens, supra note 44, at 198 (mis-citing to Bracton himself for Houck's translation and commentary).

47. *See* Stevens, supra note 44, at 197–98. The Crown's fiduciary duty did not prevent Parliament from expanding or contracting the public rights in royal lands in order to serve a legitimate public purpose. Sax 1970, *supra* note 43, at 476.

48. *See* JOHN HENRY MERRYMAN & ROGELIO PÉREZ-PERDOMO, THE CIVIL LAW TRADITION 4 (3d ed. 2007).

49. *See, e.g.*, Kenneth M. Murchison, *Environmental Law in Australia and the*

although some have adopted constitutional or statutory provisions that impose on the state trust or other obligations with respect to natural resources, the environment generally, or other matters.[50] India and the

United States: A Comparative Overview — Part 2, 11 ENVTL. & PLAN. L.J. 289, 297–99 (1994) (surveying the few Australian public trust doctrine cases, and describing the doctrine as "submerged rather than on the surface of Australian law," and as "a 'sleeping' doctrine, that is, a principle in need of specific articulation and recognition by the courts"); Tim Bonyhady, A Usable Past: The Public Trust in Australia, 12 ENVTL. & PLAN. L.J. 329, 330, 331–37 (1995) (observing that "[t]he public trust has . . . had little influence on environmental law in Australia," but offering two nineteenth-century cases as reasons for concluding that the public trust doctrine is more deeply rooted in Australian law than the conventional wisdom suggests); see also Brian J. Preston, Chief Judge, Land and Envtl. Court of N.S.W., Keynote Address to the Legal Aid New South Wales Civil Law Conference: The Environment and Its Influence on the Law 5, 6 n.38 (Sept. 26, 2007) (transcript *available a*t http://www.lawlink.nsw.gov.au/lawlink/lec/ll_lec.nsf/pages/LEC_whats_new7) (click on the link in the news story announcement of the paper presentation dated Oct. 12, 2007) (last visited Oct. 7, 2011) (citing only two public trust cases, both cited by Murchison, supra, or Bonyhady, supra, with the most recent from 1992); Paul L. Stein, Justice, Land and Envtl. Court of N.S.W., Address at the Queensland Planning and Environment Court Annual Conference: Use of Expert Assessors in the Hearing of Environmental Cases (March 26, 2002) (transcript *available at* http://www.courtwise.nsw.gov.au/lawlink/supreme_court/ll_sc.nsf/pages/SCO_speech_stein_260302) (last visited Feb. 11, 2011) (citing only four public trust cases, all cited by Murchison, *supra*, or Bonyhady, supra, with the most recent from 1993).

50. Some observers have mischaracterized cases in which courts apply or interpret these constitutional or statutory provisions as "public trust doctrine" cases. *Compare* Bruch et al., *supra* note 37, at 160–61 (citing as illustrations of the "public trust doctrine" cases in Pakistan and Kenya in which courts applied constitutional or statutory provisions), *with* Comm'r of Lands v. Coastal Aquaculture Ltd., Civil Appeal No. 252 of 1996 (Court of Appeal at Nairobi, June 27, 1997), *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf, at 296 (concerning the statutory duty of a land commissioner to specify certain information in a notice to take privately owned land for allegedly public purposes), and Niaz Mohamed Jan Mohamed v. Comm'r of Lands, Civil Suit No. 423 of 1996 (High Court of Kenya at Mombasa, Oct. 9, 1996), *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf, at 290 (concerning the statutory trust obligations of a municipal council regarding alienation of privately owned land taken for public road-building purposes), and Gen. Sec'y, W. Pak. Salt Miners Labour Union (CBA) Khewral, Jhelum v. Dir., Indus. & Mineral Dev., Punjab, Lahore, 1994 S.C.M.R. 2061 (1994), *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf, at 282 (concerning the constitutional rights to life and to the dignity of man), and In re: Human Rights Case (Env't. Pollution in Balochistan), Human Rights Case No. 31-K/92(Q), P.L.D. 1994 SUPREME CT. 102 (1992), *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf, at 280 (concerning the constitutional right to life). Although many States within the United States have adopted constitutional or statutory natural resource or environmental provisions of this type, *see, e.g.*, Stevens, supra note 44, at 226–30, they have had little impact to date, *cf., e.g.,* Janelle P. Eurick, *The Constitutional Right to a Healthy Environment: Enforcing Environmental Protection Through State and Federal Constitutions,* 11 INT'L LEGAL

United States are notable exceptions to this pattern. Both have developed robust bodies of case law interpreting and elaborating on the public trust doctrine.[51]

PERSP. 185, 201–10 (1999–2001) (surveying the jurisprudence under state constitutional provisions in the United States, with an emphasis on the challenges posed by standing requirements and the question of whether the provisions are self-executing).

51. Certain States within the United States were derived from former French or Spanish colonies. In the thirteenth century, Spain codified much of the res communis concept as restated by Justinian. *Compare* LAS SIETE PARTIDAS 3.28.6 (Samuel Parsons Scott trans. & Robert I. Burns ed., 2001) ("Rivers, harbors, and public highways belong to all persons in common, so that parties from foreign countries can make use of them, just as those who live or dwell in the country where they are situated. And although the banks of rivers are, so far as their ownership is concerned, the property of those whose lands include them, nevertheless, every man has a right to use them, by mooring his vessels to the trees, by repairing his ships and his sails upon them, and by landing his merchandise there; and fishermen have the right to deposit their fish and sell them, and dry their nets there, and to use said banks for every other purpose like these which appertain to the calling and the trade by which they live."), *with supra* notes 38–40 and 41–42 and accompanying text. In the nineteenth century, Napoleonic France did substantially the same thing. Compare CODE NAPOLEON 2.2.538 (Bryant Barrett trans., 1811) ("Roads, ways and streets maintained by the State, rivers and navigable, or floatable streams, shores, land between high and low water mark, ports, havens, moorings, and generally all parts of the French territory which are not susceptible of private ownership, are considered as dependancies [sic] of the public domain."), *with supra* notes 38–41 and accompanying text, although the French codification blended the Roman concepts of res communis (common property), *res publicum* (public property), and *jus publicum* (the right of the sovereign to manage *res communis* and *res publicum* for the benefit of the public), *and cf.* Patalano, supra note 39, at 703–04 (exploring the distinctions among res publicum, res communis, other categories of Roman property (*res*), and related rights (*jus*)).

The States within the United States that were derived from former French or Spanish colonies have incorporated the Roman *res communis* concept into their legal systems. *See, e.g.*, Gulf Oil Corp. v. State Mineral Bd., 317 So. 2d 576, 581–82 (1975) (discussing the origin of Arts. 449, 450, 453, 481, and 482 of the *Louisiana Civil Code* in effect at the time, and reproducing their language as follows: "Art. 449. Things are either common or public. . . . Art. 450. Things, which are common, are those the ownership of which belongs to nobody in particular, and which all men may freely use, conformably with the use for which nature has intended them; such as air, running water, the sea and its shores. . . . Art. 453. Public things are those, the property of which is vested in a whole nation, and the use of which is allowed to all the members of the nation; of this kind are navigable rivers, seaports, roadsteads and harbors, highways and the beds of rivers, as long as the same are covered with water. Hence it follows that every man has a right freely to fish in the rivers, ports, roadsteads, and harbors. . . . Art. 481. Things, in their relation to those who possess or enjoy them, are divided into two classes; those which are not susceptible of ownership and those which are. . . . Art. 482. Among those which are not susceptible of ownership, there are some which can never become the object of it; as things in common, of which all men have the enjoyment and use."); Dion G. Dyer, *California Beach Access: The Mexican Law and the Public Trust*, 2 ECOLOGY L.Q. 571, 601–07 (1972) (discussing the meaning and origin of the concept of *bienes* (apparently, a

According to Professor Joseph Sax, the most influential American student of the public trust doctrine, its essence is the same as the essence of property law and of the legal system generally—that is, the protection of reasonable expectations in the relative stability of relationships from destabilizing changes.[52] Therefore, there is no theoretical reason why the public trust doctrine should be limited to disputes over the disposition and use of the public waterways or lands to which it has been applied traditionally.[53] It could be applied just as appropriately and just as easily to disputes about air pollution, among other things.[54] In the 1980s, as if anticipating latter day concerns about the climatic disruption caused by anthropogenic global warming, Sax observed:

> The focus of environmental problems is *not*, as is sometimes suggested, the mere *fact* of change, which it is said environmental zealots cannot accommodate, but rather a rate of change so destabilizing as to provoke crises—social, biological and (as we see in the context of energy prices) economic. The disappearance of various species from the earth in the natural, evolutionary process is totally different from the disappearance of species over a short time. The key difference is not the *fact* of change, but the *rate* of change. The essence of the problem raised by public trust litigation is the imposition of destabilizing forces that prevent effective adaptation.[55]

Thus, he reasoned, the "central idea of the public trust is preventing the destabilizing disappointment of expectations held in common but without formal recognition" via legal mechanisms such as title.[56]

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mixture of *res communis* and *res publicum*) in the Mexican Civil Code of 1871); *cf.* LA. CIV. CODE ANN. arts. 449, 449 cmts.a–c, 450, 450 cmt. a (1980) (consisting of amended versions of most of the Louisiana code provisions reproduced in *Gulf Oil Corp., supra,* with comments illuminating the relationship between the two versions); Patalano, supra note 39, at 703–04 (exploring the distinctions among *res publicum, res communis*, other categories of Roman property (*res*), and related rights (*jus*)). The implications of the *res communis* concept per se on the trust-like duties of these States is beyond the scope of this article.

52. *See* Sax 1980, *supra* note 37, at 186–88.

53. *Cf.* Sax 1970, *supra* note 43, at 556 (arguing that the techniques used by judges in public trust cases need not be limited to the public's interest in waterways or parklands or to issues arising out of the disposition of public property).

54. *Id.* at 556–57.

55. Sax 1980, *supra* note 37, at 188.

56. *Id.*

III. THE AMERICAN PUBLIC TRUST DOCTRINE

A. The Traditional Public Trust Doctrine

The principal touchstone for the traditional American public trust doctrine, notwithstanding its ancient roots in the English common law, is *Illinois Central Railroad v. Illinois*.[57] In that case, the Illinois legislature granted to the Illinois Central Railroad Company a mile long section of the bed of Lake Michigan, which underlay almost all of Chicago's harbor, then tried to revoke the grant a few years later.[58] The Illinois Attorney General sued for a judicial determination to quiet title to the land.[59] In holding the original grant to be revocable,[60] the U.S. Supreme Court explained the implications of the traditional public trust as follows:

> [T]he State holds the title to the lands under the navigable waters of Lake Michigan, within its limits, in the same manner that the State holds title to soils under tide water, by the common law . . . . It is a title held in trust for the people of the State that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties. . . .The State can no more abdicate its trust over property in which the whole people are interested, like navigable waters and soils under them, so as to leave them entirely under the use and control of private parties, except in the instance of parcels mentioned for the improvement of the navigation and use of the waters, or when parcels can be disposed of without impairment of the public interest in what remains, than it can abdicate its police powers in the administration of government and the preservation of the peace.[61]

Although *Illinois Central Railroad* applied the traditional public trust doctrine to the conveyance of trust lands from the State to private parties, American courts have recognized that it also applies to conveyances of trust lands from state to local governments, and to changes in the use of trust lands authorized by state governments.[62]

Historically, American courts applied the traditional public trust doctrine primarily to submerged lands on the shores of the ocean or the Great Lakes, as in *Illinois Central Railroad*, to the waters above them, to

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57. 146 U.S. 387 (1892).

58. *Id.* at 433–34, 448–49.

59. *Id.* at 433.

60. *See id.*. at 455.

61. *Id.* at 452–53.

62. For the seminal synthesis of the case law, *see* Sax 1970, *supra* note 43, at 489–556. For a more historical survey, *see* Stevens, *supra* note 44, at 199–225.

the waters of substantial rivers and streams, and to public parklands.[63] Over time, American courts have recognized that it protects not just the public's right to engage in navigation, commerce, and fishing in these areas, but also its right to engage in recreation or scientific study, and to enjoy the benefits of the ecological and aesthetic functions of public trust waters and lands, among other things.[64] American courts also have expanded the scope of the traditional doctrine beyond its historic application to navigable waters, submerged lands, and parklands per se, recognizing that it also applies to public resources such as the living and nonliving resources in and on the bed of navigable waters, as well as in the boundary zone between sea and land;[65] to upland wildlife and "archaeological remains";[66] to migratory waterfowl;[67] and to dry sand beach immediately landward of the high water mark.[68]

The traditional American public trust doctrine, although rooted historically in the English common law, appears to be a creature of both state common law and federal constitutional law.[69] According to the U.S. Supreme Court, when the American colonies secured their independence from Great Britain, the people of each of the original thirteen States took title to their own navigable waters and the beds underlying them.[70] Their

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63. Sax 1970, *supra* note 43, at 556.

64. *E.g.*, Stevens, supra note 44, at 221–23; *see also*, e.g., Mont. Coal. for Stream Access v. Hildreth, 684 P.2d 1088, 1090–91, 1093, 1094 (Mont. 1984) (holding under both the public trust doctrine and the Constitution of the State of Montana that the public had a right of access to waters navigable for recreational purposes and to use their beds and banks up to the ordinary high-water mark without interference from a riparian landowner, as well as to portage around barriers "in the least intrusive manner possible, avoiding damage to the adjacent owner's property and his rights").

65. Puerto Rico v. SS Zoe Colocotroni, 456 F. Supp. 1327, 1336–37, 1344 n.42 (D.P.R. 1978), *aff'd in part and vacated in part on other grounds*, 628 F.2d 652 (1980).

66. *See* Wade v. Kramer, 459 N.E.2d 1025, 1027–28 (Ill. App. Ct. 1984). These resources were located in a local conservation area. *Id.* at 1026. Although the Illinois state appellate court recognized that the public trust doctrine applied to the wildlife and "archaeological remains," it nevertheless held that the doctrine permitted the state legislature to reallocate part of the conservation area to construction of a new highway despite the potential damage to the wildlife and "archaeological remains" in it. *See id.*. at 1028.

67. *In re* Steuart Transp. Co., 495 F. Supp. 38 (E.D. Va. 1980).

68. *E.g.*, Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 363–66 (N.J. 1984).

69. *See* Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 ENVTL. L. 425 (1988–89); *but cf.* Crystal S. Chase, *The Illinois Central Public Trust Doctrine and Federal Common Law: An Unconventional View*, 16 HASTINGS W.-NW. J. ENVT'L L. & POL'Y 113 (2010) (misconstruing federal case law as federal common law in arguing that the latter is the source of the traditional public trust doctrine).

70. Martin v. Waddell, 41 U.S. (16 Pet.) 367, 410 (1842); *see also Wilkinson, supra*

right to use these resources for common purposes was limited only by the rights that the States later gave up to the Federal Government when they ratified the Constitution.[71] Under the constitutional equal footing doctrine developed by the Court, the same rule applies to the new States subsequently admitted to the Union.[72]

One of the federal limits on State sovereignty over these resources is the traditional public trust doctrine as articulated in *Illinois Central Railroad*.[73] Both the Court's opinion and the briefs filed by the parties in that case make clear that the doctrine exists as a matter of federal law, not the law of the individual States,[74] although the Court has never been more specific about its latter day source.[75] As Professor Charles Wilkinson argues in his seminal article on the subject, however, the most likely source of the traditional public trust doctrine is the Constitution's Commerce Clause, which is also the source of the federal navigation servitude that applies to the same waterways.[76] Moreover, the substantive requirements of the trust most likely are derived from both the Commerce Clause itself, which establishes minimum requirements, and state common law, which fleshes out the details.[77] At a minimum, federal

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note 69, at 439 (noting that, historically, the question of ownership of lands under navigable waters was answered easily with respect to the original thirteen States because these lands never passed from them to the United States after independence).

71. *Martin*, 41 U.S. (16 Pet.) at 410. For the classic account of the drafting and ratification of the Constitution, see CATHERINE DRINKER BOWEN, MIRACLE AT PHILADELPHIA (2d ed. 1986).

72. Pollard's Lessee v. Hagan, 44 U.S. (3 How.) 212, 228–30 (1845); see also Wilkinson, supra note 69, at 439–45 (tracing the development of the constitutional equal footing doctrine in the nineteenth century with respect to the lands under navigable waters). For a critique of the case law, see id. at 445–47. The Court also gradually developed a concept of navigable waters more expansive than the English common law conception. E.g., *id*. at 447–48.

73. *See Wilkinson*, *supra* note 69, at 450–53.

74. *Id.* at 453–55.

75. *Id.* at 455.

76. *Id.* at 458–59; see also U.S. CONST. art. I, § 8, cl. 3 ("The Congress shall have Power . . . To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."). For analyses of the most likely alternatives to the Interstate Commerce Clause as the source of the traditional public trust doctrine in federal law, see Wilkinson, supra note 69, at 455–58. The argument that the traditional public trust doctrine is rooted in federal common law is especially unpersuasive. *Cf.* Erie R.R. v. Tompkins, 304 U.S. 64, 78 (1938) (holding that the lower federal court was not free to disregard the common law of the Commonwealth of Pennsylvania in resolving the parties' dispute because "[t]here is no federal general common law"); *see generally* Chase, supra note 69 (misconstruing federal case law as federal common law in arguing that the latter is the source of the traditional public trust doctrine).

77. Wilkinson, *supra* note 69, at 460–64. For the alternatives to this federal-state conception, see id. at 459–60.

constitutional law prohibits the States from abandoning their trust obligations entirely, although it permits them to exercise so much discretion in fulfilling those obligations that this minimum standard is of little practical importance.[78]

B. The Federal Public Trust Doctrine

A federal public trust doctrine distinct from the traditional doctrine exists in the United States, notwithstanding the tendency of some legal scholars to conflate the two in some contexts.[79] The federal public trust doctrine is a pale shadow of its traditional counterpart, however.[80] The principal touchstone for the federal doctrine is *United States v. Beebe*.[81] In that case, the United States sought to cancel certain land patents issued to a private citizen by the United States decades earlier that purported to give him title to property on which part of a city had been built since.[82] In holding that the Attorney General had the authority to bring suit on behalf of the United States to cancel these patents,[83] the Supreme Court recognized that "[t]he public domain is held by the [Federal] Government as part of its trust[,] . . . the title [to] which [is] . . . common to all the people as the beneficiaries of the trust."[84] The Court has made clear that Congress has plenary authority to determine by statute how the federal trust in public lands shall be administered, however,[85] and thus

78. *See id.* at 464.

79. *Cf.* ZYGMUNT J. B. PLATER, ROBERT H. ABRAMS, WILLIAM GOLDFARB, ROBERT L. GRAHAM, LISA HEINZERLING & DAVID A. WIRTH, ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 1101 (3d ed., 2004) (including in a list of cases in which "the trust doctrine" has been applied both traditional public trust doctrine cases and federal public trust doctrine cases).

80. *See* Eric Pearson, The Public Trust Doctrine in Federal Law, 24 J. LAND RESOURCES & ENVTL. L. 173 (2004).

81. 127 U.S. 338 (1888).

82. *Id.* at 338.

83. *See id.* at 342–43.

84. *Id.* at 342. A few years later, the Court invoked the Federal Government's public trust obligations again in resolving another land title dispute. *See* Knight v. U.S. Land Ass'n, 142 U.S. 161, 183 (1891). In that case, the Court also distinguished between the federal trust as it applies to uplands, of which all Americans are the beneficiaries, and the federal trust as it applies to tidelands in newly acquired territories, of which the beneficiaries are the future States that might be formed out of those territories. *See id.* at 183, 185–86.

85. *See* Light v. United States, 220 U.S. 523, 537 (1911); *cf.* Sierra Club v. Block, 622 F. Supp. 842, 865–66 (D. Colo. 1985), vacated on other grounds *sub nom*. Sierra Club v. Yeutter, 911 F.2d 1405 (10th Cir. 1990) (holding that the public trust obligations of federal land management agencies are limited to the duties prescribed by statute). One U.S. district court at least arguably has asserted that the federal public trust doctrine

that the federal public trust doctrine does not constrain the Federal Government in the way that the traditional doctrine constrains the States.

IV. THE INDIAN PUBLIC TRUST DOCTRINE

Whereas the traditional American public trust doctrine has developed primarily by accretion, the Indian variant is mostly the product of adoption and expansion. In 1996, the Indian Supreme Court essentially imported the American variant of the traditional public trust doctrine, declaring it to be part of Indian law—although even in that case the Court began to stretch the public trust doctrine beyond its traditional bounds. In *Mehta v. Nath*,[86] a company with ties to the family of a Minister for Environment and Forests had built a riverside motel resort

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prohibits the Federal Government from conveying submerged lands below the low-water mark to private parties free of the public trust. *See* United States v. 1.58 Acres of Land, 523 F. Supp. 120, 124 (D. Mass. 1981). The court referred to the public trust at issue as one "administered jointly by the state and federal governments," however, *see id.* at 124; *see also id*. at 122, 124 (referring to the trust as "administered by both the federal and state sovereigns" and as "administered by the state and federal governments"), and cited to *Illinois Central Railroad*, the principal touchstone of the traditional public trust doctrine, *see supra* notes 57–61 and accompanying text, in describing the nature and status of that trust, see id. at 123, 124. In explaining the Federal Government's role in administering the trust described in *Illinois Central Railroad*, however, the district court in 1.58 Acres of Land cited to part of Justice Reed's concurring opinion in Alabama v. Texas, 347 U.S. 272, 277 (1954) (Reed, J., concurring), although the district court misidentified that part of Justice Reed's concurrence as part of Justice Black's dissent, *see* 1.58 Acres of Land, supra, at 123 n.3. In his concurring opinion in *Alabama v. Texas*, Reed essentially restated the federal public trust doctrine rule articulated in Light, according to which Congress has plenary power to determine by statute how the federal trust in public lands shall be administered. Compare 347 U.S. at 277, with 220 U.S. at 537. (In making a similar point, the per curiam majority in *Alabama v. Texas* quoted a passage from *United States v. Midwest Oil Co.,* 236 U.S. 459, 474 (1915), which also cited to *Light,* see 347 U.S. at 273.) The genealogy of the district court's arguable assertion in 1.58 Acres of Land that the federal public trust doctrine prohibits the Federal Government from conveying submerged lands below the low water mark to private parties free of the public trust, which starts with *Light* and proceeds through *Illinois Central Railroad by* way of Justice Reed's concurring opinion in *Alabama v. Texas*, strongly suggests that the federal trust obligation to which the district court referred was not the federal public trust per se, but rather the federal navigation servitude, which the Supreme Court in *Illinois Central Railroad* identified as an important constraint on the States' sovereignty over tidelands and other waters that are navigable in fact. *See* 146 U.S. at 435–37.

86. (1997) 1 S.C.C. 388. The opinion is reprinted in UNEP/UNDP/DUTCH GOVERNMENT JOINT PROJECT ON ENVIRONMENTAL LAW AND INSTITUTIONS IN AFRICA, 1 COMPENDIUM OF JUDICIAL DECISIONS ON MATTERS RELATED TO ENVIRONMENT: NATIONAL DECISIONS 259 (1998), *available at* http://www.unep.org/padelia/publications/Jud.Dec.Nat.pre.pdf.

that encroached on protected forest land, which the State of Himachal Pradesh later leased to the company during the minister's term in office.[87] After suffering flood damage to the property, the company used heavy earth moving equipment to divert the river flow into a newly dredged part of the channel, and otherwise to protect the resort from floods.[88] The Indian Supreme Court invalidated the leases as a breach of the public trust, and, in accordance with the polluter pays principle, ordered the company to pay for the ecological restoration of the leased land, and of the adjacent lands adversely affected by the company's efforts to protect the leased land from floods.[89] In doing so, the Court acknowledged the roots of the doctrine in the Roman *res communis* concept and the English common law,[90] engaged in a lengthy analysis of American public trust jurisprudence and scholarship,[91] and ultimately declared:

> Our legal system—based on English common law—includes the public trust doctrine as part of its jurisprudence. The State is the trustee of all natural resources which are by nature meant for public use and enjoyment. Public at large is the beneficiary of the sea-shore, running waters, airs, forests and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership.[92]

In reaching this conclusion, the Court observed, "We see no reason why the public trust doctrine should not be expanded to include all ecosystems operating in our natural resources."[93]

Since then, the Indian Supreme Court has invoked the public trust doctrine in two other cases. In *M.I. Builders v. Sahu*,[94] a municipal corporation authorized a private company to construct and operate an underground shopping center and parking lot in a public park of historical importance and environmental value on terms that benefitted only the company.[95] The Court held the transaction to be invalid,[96] declaring it to be an "outrageous" example of bad governance,[97] and

87. Mehta v. Nath, (1997) 1 S.C.C. 388, at para. 1–¶ 13.
88. *Id.* ¶ 19.
89. *Id.* ¶¶ 36–39.
90. *See id*. ¶ 24.
91. *See id*. ¶¶ 24–33.
92. *Id.* ¶ 34.
93. *Id.* ¶ 33.
94. A.I.R. 1999 SC 2468, available at http://judis.nic.in/supremecourt/chejudis.asp.
95. M. I. Builders, A.I.R. 1999 SC 2468, at para. 1, ¶¶ 11, 50, 56–57, 69.
96. *Id*. ¶ 58.
97. *See id.*

ordered the municipal corporation both to dismantle most of the construction and to restore the park to as close to its original condition as was practicable given the irreversible changes that had been made to it.[98] In doing so, the Court concluded that the agreement between the municipal corporation and the developer had violated the public trust doctrine,[99] which it emphasized "is part of Indian law."[100] The Court cited *Mehta v. Nath* as the case in which the doctrine was "expounded,"[101] and to a leading American environmental law casebook for analyses of the history and theory of the doctrine and of *Illinois Central Railroad*,[102] but ultimately remarked that "[t]his public trust doctrine in our country, it would appear, has grown from Article 21 of the Constitution."[103] Article 21 declares that "[n]o person shall be deprived of his life or personal liberty except according to procedure established by law,"[104] but the Court has interpreted it to be a source of a substantive environmental civil right.[105] The Court's rationale for identifying this constitutional provision as the likely source of the Indian public trust doctrine is not clear.[106] What is clear is that the Court

98. *Id.* ¶ 76; *see also id*. ¶¶ 50, 72 (noting that the construction had caused irreversible changes to the park, and recognizing that it might not be possible to restore the park to its original condition because trees planted to replace the ones chopped down will take years to grow).

99. *Id.* ¶ 51.

100. *See id.* ¶ 50.

101. *See id.* ¶ 50.

102. *See id.* ¶ 51.

103. *Id*.

104. INDIA CONST. art. 21.

105. *See* Jona Razzaque, Human Rights and the Environment: The National Experience in South Asia and Africa § 2.1.1, in JOINT UNEP-OHCHR EXPERT SEMINAR ON HUMAN RIGHTS AND THE ENVIRONMENT (Background Paper No. 4) (Office of the United Nations High Comm'r for Human Rights ed., 2002), http://www2.ohchr.org/english/issues/environment/environ/index.htm.

106. It is possible that the Supreme Court was influenced by the opaque decision rendered almost a year earlier by the High Court of Jammu and Kashmir in *Th. Majra Singh v. Indian Oil Corp.*, A.I.R. 1999 J. & K. 81, *available at* http://www.indiankanoon.org/doc/201603, which seems to be the only case reported to date in which a court subordinate to the Indian Supreme Court has applied the public trust doctrine, *cf.* Jona Razzaque, *Application of Public Trust Doctrine in Indian Environmental Cases*, 13 J. ENVTL. L. 221 (2001) (briefly analyzing the three Indian public trust doctrine cases reported through *M.I. Builders v. Sahu*). The petitioners in Indian Oil Corp. challenged the siting of a facility for filling cylinders with liquefied natural gas. A.I.R. 1999 J. & K. 81, at ¶ 1. In holding that the governmental authorities must take the precautionary principle into account in reviewing the siting request, *see id.* ¶ 7, the High Court lifted almost all of the language of its description of the history and content of the public trust doctrine from *Mehta v. Nath*, albeit without quotation marks, and declared that "[t]hese concepts have now become part of Indian legal thought

considered the municipal corporation to have abandoned its trust obligations completely by entering into such a one-sided agreement with the developer.[107]

Most recently, in *Reliance Natural Resources Ltd. v. Reliance Industries*,[108] the Indian Supreme Court recognized in the context of resolving a complex, intra-family business dispute that the public trust doctrine applies to natural gas deposits located in Indian waters.[109] In that case, the Government of India had leased rights to certain offshore lands to a private consortium for natural gas development and production pursuant to a production sharing contract.[110] The Court held in part that a clause of the public agreement through which the family members had implemented their private agreement to divide up their business interests must be interpreted so as to require consideration of both the

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process," *id*. ¶ 5. In listing the sources of this description of the public trust doctrine, however, the High Court cited not only to *Mehta v. Nath*, but also to seven other judicial opinions that do not appear to be public trust doctrine cases. *See id.; see also, e.g.,* Jagannath v. Union of India, A.I.R. 1997 S.C. 811, available at http://indiankanoon.org/doc/507684/ (deciding the case on precautionary principle, polluter pays principle, and other grounds); Vellore Citizens' Welfare Forum v. Union of India, A.I.R. 1996 S.C. 2715, *available at* http://judis.nic.in/supremecourt/chejudis.asp (deciding the case on precautionary principle and polluter pays principle grounds); Indian Council of Enviro-Legal Action v. Union of India, A.I.R. 1995 S.C. 2252, available at http://indiankanoon.org/doc/1315992/ (modifying an earlier order in Action Comm. v. Union of India, 1994 5 S.C.C. 244, *available at* http://indiankanoon.org/doc/1774631/, which was decided on constitutional grounds). The High Court then asserted:

> As a matter of fact, this is now considered as part and parcel of Article 21 of the Constitution of India. . . . These "precautionary principles" were recognised by the Supreme Court of India in Vellore Citizens Welfare Forum v. Union of India [citation omitted].

Indian Oil Corp., A.I.R. 1999 J. & K. 81, at ¶ 6. The Supreme Court's decision in *Vellore Citizens Welfare Forum v. Union of India*, A.I.R. 1996 S.C. 2715, *available at* http://judis.nic.in/supremecourt/chejudis.asp, rested on the precautionary and polluter pays principles, both of which the Supreme Court seemed to conclude were manifest in Article 21 and certain other constitutional and statutory provisions. As one would expect in a case decided before *Mehta v. Nath*, however, the Supreme Court in *Vellore Citizens* did not mention the public trust doctrine at all. Thus, the line of reasoning that led the High Court of Jammu and Kashmir to conclude in *Indian Oil Corp*. that the Indian public trust doctrine is rooted in Article 21 of the Indian Constitution is opaque at best. To the extent that the High Court's decision in *Indian Oil Corp*. influenced the Supreme Court in *M. I. Builders* to identify Article 21 as the likely source of the Indian public trust doctrine, then the Supreme Court's reasoning in *M. I. Builders* is equally obscure.

107. *See* M. I. Builders v. Sahu, A.I.R. 1999 SC 2468, at ¶¶ 56–57, *available at* http://judis.nic.in/supremecourt/chejudis.asp.

108. SCC Civ. App. No. 4273 (May 7, 2010), *available at* http://judis.nic.in/supremecourt/chejudis.asp.

109. *See, e.g*., Reliance Industries, SCC Civ. App. No. 4273, at ¶¶ 84–86.

110. *See id*. ¶ 6(a), (c), (e).

Government's natural gas policy and the broader national and public interest.[111] In doing so, the Court reasoned that "gas is an essential natural resource" owned by neither of the private disputants, which "[t]he Government holds . . . as a trust for the people of the country."[112] Similarly, in concluding that the production sharing contract trumped any other contract entered into by the contractor to supply the gas,[113] the Court reasoned that the contractor could not transfer any rights to the gas beyond those conferred by the production sharing contract itself because the Government holds the gas in trust for the people, and therefore continues to own it until it reaches the consumer.[114] Moreover, in further construing the terms of this contract,[115] the Court invoked the mandate established by Article 297 of the Indian Constitution.[116] Article 297 declares in relevant part that "[a]ll lands, minerals and other things of value underlying the ocean within the territorial waters, or the continental shelf, or the exclusive economic zone, of India shall vest in the Union and be held for the purposes of the Union."[117] The Court observed that the word "vest" must be interpreted in the light of the public trust doctrine, which although previously applied in environmental cases "has its broader application."[118] In addition, the Court quoted extensively from *Mehta v. Nath*, including its reference to the English common law as the basis of the Indian legal system,[119] emphasized that the doctrine described in that case "is part of Indian law,"[120] and asserted that the doctrine required the Government "to provide complete protection to the natural resources as a trustee of the people at large."[121] The Court then reiterated the essence of its earlier

111. *See id*. ¶ 45–47; *see also id*. ¶¶ 6(k)–(m), (12)(2), 27(e), (i), 92(C) (describing the public and private agreements, the legal issue raised by the clause in question as framed by the lower court, and related legal issues raised by the appeal as framed by the Supreme Court itself, and summarizing the Supreme Court's conclusion with respect to the need to consider the "broader national and public interest" in interpreting the clause).

112. *Id.* ¶ 46.

113. *See id*. ¶ 64; cf. id.¶ 27(g) (identifying whether the court must interpret the provisions of the production sharing contract as an issue raised by the appeal).

114. *Id.* ¶ 64.

115. *Cf. id*. ¶ 77 (asserting the usefulness of recapitulating certain facts and deciding the issue of the Government's role in the arrangement created by the production sharing contract).

116. *See id*. ¶ 84; *see also id*.¶ 17 (reproducing Article 297).

117. INDIA CONST. art.297, § 1.

118. Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273, at ¶ 84 (May 7, 2010), available at http://judis.nic.in/supremecourt/chejudis.asp.

119. *See id*. ¶ 85.

120. *See id*.

121. *Id.*

conclusion about the limited nature of the rights to the gas acquired by the contractor under the production sharing contract.[122] In doing so, it asserted that "the very basis of [the contractor's] mandate is the *constitutional concepts* [discussed earlier in the opinion], including Article 297 . . . and the Public Trust Doctrine."[123]

Four features of these cases stand out. First, they evince the Indian Supreme Court's ongoing desire to ground its public trust jurisprudence in India's English common law heritage. After prefacing its lengthy exploration of the American public trust doctrine in *Mehta v. Nath* with an acknowledgement of the historical contribution made by the English common law,[124] the Court declared that "[o]ur legal system—based on English common law—includes the public trust doctrine as part of its jurisprudence."[125] More than ten years later, in *Reliance Industries*, the Court quoted this same declaration before asserting again that the public trust doctrine is part of Indian law.[126] Thus, whatever other sources of law the Indian courts might consult to flesh out the content of the public trust doctrine, its existence as an enforceable legal doctrine is clearly a function of the Indian common law.

Second, these cases manifest an ongoing shift away from the Court's initial reliance on American law as the touchstone for the trust's content toward a uniquely Indian conception that the Court deems to spring from some set of Indian constitutional principles. In *Mehta v. Nath*, the court clearly looked to American jurisprudence and scholarship for its conception of the trust's purposes, content, and scope.[127] A few years later, in *M.I. Builders*, the Court continued to do so, relying on a leading American environmental law casebook, including its analysis of *Illinois Central Railroad*, for the Court's own explanation of the history,

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122. *See id*. ¶ 86.

123. *See also id.* ¶ 91(1), (3) (including among the "broad sustainable conclusions" derived from the Government's role in the production sharing arrangement that "[t]he natural resources are vested with the Government as a matter of trust in the name of the people of India," and that "[t]he broader constitutional principles, [among other things,] . . . mandate[] the Government to determine the price of the gas before it is supplied by the contractor").

124. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 24; *cf. id.* ¶ 33 (emphasizing that American courts have expanded the scope of the uses protected by the public trust doctrine beyond its historic focus on navigation, commerce, and fishing under the English common law).

125. *Id.* ¶ 34.

126. *See* Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273 (May 7, 2010), at ¶ 85, *available at* http://judis.nic.in/supremecourt/chejudis.asp (quoting Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 34, but misidentifying the paragraph quoted as ¶ 27).

127. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶¶ 24–34.

purposes, and content of the doctrine.[128] The Court ultimately concluded, however, albeit without explanation, that "[t]his public trust doctrine in our country, it would appear, has grown from Article 21 of the constitution."[129] Article 21 purports merely to protect the lives and personal liberty of individuals,[130] but the Court has interpreted it to be a source of a substantive environmental civil right.[131] A decade after *M.I. Builders*, in *Reliance Industries*, the Court dispensed with any reference to American law or scholarship,[132] merely quoting two paragraphs from *Mehta v. Nath* that omitted any mention of either,[133] and identified the public trust doctrine as one of the "constitutional concepts" implicated in the case.[134] Although the Court concluded that Article 297, which declares that certain offshore resources "shall vest in the Union and be held for the purposes of the Union,"[135] must be interpreted in the light of the public trust doctrine,[136] it clearly did not identify Article 297 as the doctrine's source. Thus, although the Court has moved away from a reliance on American law as the touchstone for the trust's content, the only clue to the indigenous constitutional source of that content—at least as the Court currently understands it—is the Court's cryptic reference in *M.I. Builders* to Article 21.[137]

Third, *Reliance Industries* demonstrates the Court's willingness, in defining the universe of resources to which the doctrine applies, to go far beyond its dictum in *Mehta v. Nath* regarding the applicability of the public trust doctrine to "all ecosystems operating in our natural resources."[138] Not only has the court applied the public trust doctrine to an environmentally and historically significant public park,[139] which the

128. *See* M. I. Builders v. Sahu, A.I.R. 1999 SC 2468, at ¶ 51, *available at* http://judis.nic.in/supremecourt/chejudis.asp.

129. *Id*.

130. *See* INDIA CONST. art. 21.

131. *See* Razzaque, supra note 105.

132. *See* Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273 (May 7, 2010), at ¶¶ 84–86, *available at* http://judis.nic.in/supremecourt/chejudis.asp.

133. *See id*. ¶ 85 (quoting Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶¶ 25, 34, but misidentifying the paragraphs quoted as ¶¶ 17 and 27).

134. *Id.* ¶ 86.

135. INDIA CONST. art. 297, § 1.

136. Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273 (May 7, 2010), at ¶ 84, available at http://judis.nic.in/supremecourt/chejudis.asp.

137. *Cf.* M. I. Builders v. Sahu, A.I.R. 1999 S.C. 2468, at ¶ 51, *available at* http://judis.nic.in/supremecourt/chejudis.asp ("This public trust doctrine in our country, it would appear, has grown from Article 21 of the Constitution.").

138. Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33.

139. *Supra* notes 94–107 and accompanying text.

traditional American variant recognizes as a public trust resource,[140] but also to natural gas,[141] which the American variant clearly does not recognize. Although the production and use of natural gas has obvious ecological implications, including for global climate change,[142] the *Reliance Industries* Court focused only on its public value as an economic resource.[143]

Finally, these cases make clear that the Indian public trust doctrine is solely a creature of Indian federal law, and is not, like its American cousin, dependent on state law for any of its content. Since declaring in *Mehta v. Nath* that the public trust doctrine is "part of [Indian] jurisprudence,"[144] the Indian Supreme Court has emphasized and reemphasized that the doctrine is part of "Indian law" per se,[145] without reference to any role that the States otherwise might play in fleshing out its content.[146] The disparity between the Indian and traditional American variants of the public trust doctrine in this regard is a function of how the Indian and American central governments acquired their sovereignty in the context of their respective federations. In the United States, the Federal Government acquired its sovereignty from the individual States, with the residuum remaining in the States that created that Federal Government.[147] In India, the Union Government acquired its sovereignty directly from the people, with the residuum residing in the Union Government itself.[148]

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140. *See supra* note 63 and accompanying text.

141. *Supra* notes 108–23 and accompanying text.

142. The components of natural gas are more powerful GHGs than CO2 when released into the atmosphere, although natural gas also produces CO2 when burned. *Cf.* WEART, *supra note* 2, at 2, 26–30, 114, 126–29 (comparing the current and potential future contributions to global warming of anthropogenic CO2 and other anthropogenic GHGs that have a much greater warming potential per molecule but are emitted in much smaller amounts).

143. *See, e.g.,* Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273, at ¶¶ 16–21 (May 7, 2010), *available at* http://judis.nic.in/supremecourt/chejudis.asp.

144. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 34.

145. *See* Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273, at ¶ 85; M. I. Builders v. Sahu, A.I.R. 1999 SC 2468, at ¶ 50, *available at* http://judis.nic.in/supremecourt/chejudis.asp.

146. If the States were to play a role in fleshing out the content of the public trust doctrine in the Indian context, then it would be through legislation. A distinction between state common law and federal common law would not be relevant because the Indian judiciary is unitary. See INDIA CONST. art. 141.

147. *See* BOWEN, supra note 71, at 3–15, 32–33; see also U.S. CONST. amend X ("The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.")

148. *See, e.g.*, GRANVILLE AUSTIN, THE INDIAN CONSTITUTION: CORNERSTONE OF A

V. PUBLICLY OWNED FORESTS AS RESOURCES SUBJECT TO THE PUBLIC TRUST

A. U.S. Forests

1. Publicly Owned Forests as Resources Subject to the Traditional Public Trust Doctrine

Only two American courts—in the context of the same federal case—seem to have recognized either explicitly or implicitly that the traditional public trust applies to publicly owned forests.[149] In *Puerto Rico v. SS Zoe Colocotroni*,[150] the Commonwealth of Puerto Rico and its Environmental Quality Board sued the owner of an oil tanker in admiralty to recover damages for impairment of the ecological value of mangrove forests, among other things, as the result of the intentional release of 1.5 million gallons of crude oil into waters a few miles off the Puerto Rican coast by the oil tanker in an effort to free itself from where it had run aground.[151] The oil slick came ashore and infiltrated various "mangrove areas" in and around a bay.[152] In holding that the plaintiffs had standing to sue for damages, the U.S. District Court for the District of Puerto Rico emphasized that the Commonwealth has title to all beaches and the "maritime terrestrial zone" abutting its navigable waters, and "in particular to the mangrove areas which are a part of the same," and therefore holds them in trust for the benefit of its people.[153] On appeal, the U.S. Court of Appeals for the First Circuit affirmed in part

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NATION 192–94 (1966).

149. Although a Michigan state trial court also held trees along a scenic roadway to be subject to a public trust, it did so under a state statute that declared certain natural resources to be imbued with such a trust. See Irish v. Green, 4 Env't Rep. Cas. (BNA) 1402, 1404–05 (Mich. Cir. 1972); *but cf*. PLATER, *supra note* 79, at 1101 (characterizing both the Michigan case and a case in which a federal court held mangroves to be subject to the state common law public trust as "trust cases").

150. 456 F. Supp. 1327 (D.P.R. 1978), *aff'd in part and vacated in part on other grounds*, 628 F.2d 652 (1980).

151. *SS Zoe Colocotroni,* 456 F. Supp. at 1330–31, 1333; *see also id*. at 1339–42, 1344–45 (describing how the oil came ashore, spread throughout the affected ecosystems, and was cleaned up, as well as the details of the damage caused to the mangroves). Although Puerto Rico is not a State per se within the United States, it has many of the attributes of a State, including the duty to protect the public trust in "the public property and domain" to which it holds title. *Id.* at 1336.

152. *Id.* at 1337–41.

153. *See id.* at 1336–37; see also id. at 1344 n. 42 (noting that "[a]s explained previously, the affected flora and fauna were part of a trust held for the people by the Commonwealth of Puerto Rico").

and vacated and remanded in part.[154] The court recognized that the oil damaged some of the "mangrove forests," which performed ecologically valuable functions.[155] In holding that the plaintiffs had stated a cognizable cause of action, however, the court declined to reach the issue of whether the traditional public trust doctrine applied to the "mangrove trees" and other natural resources in question because a Commonwealth statute otherwise authorized the Environmental Quality Board to recover damages for the impairment of natural resources or the environment generally in certain circumstances.[156] Thus, the First Circuit apparently left undisturbed the district court's general conclusion that the traditional public trust doctrine applies to "mangrove areas."[157]

Two features of these cases stand out. First, notwithstanding the First Circuit's characterization of the district court's holding with respect to standing as applying to recovery for damages to mere "mangrove trees,"[158] among other resources, the district court clearly concluded that the public trust applied to the ecological communities of organisms of which mangroves apparently were the keystone species.[159] In describing the setting for the environmental damage caused by the oil spill, the district court distinguished between the "mangrove components" of the larger bay ecosystem, which served as breeding, feeding, and nursery grounds for various species, and "the mangroves themselves," which served as the basis of the aquatic food chain.[160] In detailing the damages caused by the spill, the district court focused on both "mangrove

154. Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 628 F.2d 652, 678 (1st Cir. 1980).

155. *See id*. at 657–59.

156. *Id*. at 670–72. The court of appeals reframed as a question of whether plaintiffs had stated a cognizable cause of action what the district court and the parties had framed as a question of "standing." *See id*. at 670.

157. The First Circuit characterized the district court's holding regarding standing as one that applied to recovery for damages to "mangrove trees," however, among other natural resources. *Id.* at 670. The First Circuit also asserted that the Commonwealth of Puerto Rico had sought to recover for "the loss of living natural resources on the land such as trees." *Id.* at 670–71.

158. *Cf., e.g*., Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 628 F.2d 652, 670 (1st Cir. 1980).

159. *See* Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 456 F. Supp. 1327, 1339 (D.P.R. 1978). A "community" in the ecological sense is "any grouping of populations of different organisms found living together in a particular environment; essentially, the biotic component of an ecosystem." OXFORD UNIV. PRESS, THE CONCISE OXFORD DICTIONARY OF ECOLOGY 100 (3d ed. 2005). A "keystone species" is "[a] species that has a disproportionately strong influence within a particular ecosystem, such that its removal results in severe destabilization of the ecosystem and can lead to further species losses." *Id.* at 245.

160. *See* SS Zoe Colocotroni, 456 F. Supp. at 1339.

mortality"—apparently, the mortality of individual mangrove trees—and the reduction in macrobiotic diversity in the "mangrove community" in which that mortality took place.[161] Thus, to the extent that the First Circuit's decision left undisturbed the district court's conclusion that the traditional public trust doctrine applies to mangroves,[162] the latter clearly applies to the mangrove dominated ecosystems that the district court called mangrove "areas,"[163] and which the First Circuit called mangrove "forests."[164]

The second noteworthy feature of these cases is a constraint on the precedential value of the first noteworthy feature. Even to the extent that the district court's conclusion that the public trust doctrine applies to mangrove forest ecosystems remains good law,[165] it did not expand the scope of the public trust doctrine beyond the submerged settings to which the doctrine was applied historically. The species of mangroves affected by the oil in *SS Zoe Colocotroni* grow either in submerged soil or on land that is flooded regularly by the tide.[166]

2. Publicly Owned Forests as Resources Subject to the Federal Public Trust Doctrine

The federal public trust clearly applies to federally owned forests. In *Light v. United States*,[167] the U.S. Supreme Court made clear that Congress has plenary authority to determine by statute how the federal trust in public lands shall be administered.[168] The setting for the dispute was a federal forest reserve,[169] a predecessor of today's national

161. *See id*. at 1344.

162. *Cf. supra* notes 155–57 and accompanying text (analyzing the relevant parts of the First Circuit's opinion in the case).

163. *See* Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 456 F. Supp. 1327, 1338, 1344 (D.P.R. 1978). The district court also referred to one of these "mangrove areas" as a "mangrove stand." See id. at 1338. A "stand" in the ecological sense is "[t]he standing growth of plants (e.g. trees)" or, more formally, "[i]n vegetation classification, a distinctive plant association that may be recognized elsewhere." OXFORD UNIV. PRESS, supra note 159, at 412.

164. *See* Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 628 F.2d 652, 658 (1st Cir. 1980). The First Circuit referred to one group of mangroves as a "stand." *See id*. For the ecological meaning of "stand," *see supra* note 163.

165. *Cf. supra* notes 155–57 and accompanying text (analyzing the relevant parts of the First Circuit's opinion in the case).

166. Commonwealth of Puerto Rico v. SS Zoe Colocotroni, 456 F. Supp. 1327, 1338 (D.P.R. 1978).

167. 220 U.S. 523 (1911).

168. *See* Light v. United States, 220 U.S. at 537.

169. *See id*. at 524–25.

forests.[170] American courts also have applied the federal public trust doctrine to privately owned timberland located upstream and upslope of a national park under federal statutes that apply either to national parks generally or to the specific national park at issue.[171] The most important federal statute regarding the application of the federal public trust doctrine to forests, however, is the Multiple-Use and Sustained-Yield Act ("MUSYA"),[172] which specifies the management goals for the national forests that comprise sixty percent of all publicly owned forests in the United States.[173] In preambular language the MUSYA declares that Congress's policy is for the national forests to be administered for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes," which supplement the timber supply, water flow, and general forest improvement and protection purposes for which they were established.[174] The heart of the MUSYA, however, is the requirement that the Secretary of Agriculture "develop and administer the renewable surface resources of the national forests for multiple use and sustainable yield of the several products and services obtained therefrom."[175] In relevant part, the statute defines "multiple use" as "[t]he management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people."[176] It defines "sustained yield of the several products and services" as "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable

170. *See generally* CONG. RESEARCH SERV., supra note 32, at text accompanying notes 8–9 (summarizing the history of what is now the National Forest System since the late nineteenth century).

171. *See* Sierra Club v. Dep't of Interior, 398 F. Supp. 284, 285, 287 (N.D. Cal. 1975); Sierra Club v. Dep't of Interior, 376 F. Supp. 90, 92–93, 95–96 (N.D. Cal. 1974).

172. 16 U.S.C. §§ 528–31 (2006).

173. *See id*. § 528; see also supra note 32 and accompanying text (establishing the proportion of publicly owned forests in the United States comprised by the National Forest System); but cf. 16 U.S.C. § 475 (2006) (establishing narrower goals for the establishment, administration, and control of national forests established pursuant to a nineteenth-century statutory provision repealed in 1976).

174. 16 U.S.C. § 528 (2006); see also id. § 475 (establishing narrower goals for the establishment, administration, and control of national forests established pursuant to a nineteenth-century statutory provision repealed in 1976). The MUSYA specifies that the establishment and maintenance of wilderness areas is consistent with these purposes. *Id.* § 529. For an influential insider's account of the establishment and challenges faced in the early expansion and administration of what is now the National Forest System, see GIFFORD PINCHOT, BREAKING NEW GROUND 79–132 (1947); *cf.* National Forest Management Act, 16 U.S.C. § 1609(a) (2006) (defining the scope of the National Forest System).

175. 16 U.S.C. § 529 (2006).

176. *Id.* § 531(a).

resources of the national forests without impairment of the productivity of the land."[177] Thus, the MUSYA makes clear that the Federal Government has a fiduciary duty to manage the national forests as resources for the public's benefit.

B. Indian Forests

The Indian public trust doctrine clearly applies to publicly owned forests. The setting for *Mehta v. Nath*,[178] in which the Indian Supreme Court recognized the public trust doctrine as part of Indian law,[179] was State-owned forested land that had been converted to a private use.[180] In that case, the court clearly recognized that the corpus of the public trust includes forest ecosystems, not merely the land on which forests happen to be growing. The court invoked *National Audubon Society v. Superior Court of Alpine County*,[181] in which the Supreme Court of California recognized that the purposes of the public trust include the protection of ecological values,[182] to suggest that ecological values should be used to determine which resources are subject to the public trust doctrine.[183] The court went on to invoke *Phillips Petroleum Co. v. Mississippi*[184] as a purported illustration of this approach.[185] In *Phillips Petroleum*, the U.S. Supreme Court held that the State of Mississippi's title to tidelands extended to all lands subject to the ebb and flow of the tide, whether or not the waters that flowed over them were navigable in fact.[186] According to the Indian Supreme Court, *Phillips Petroleum* "assumes importance because the [U.S.] Supreme Court expanded the public trust doctrine to identify the tide lands not on commercial considerations but on ecological concepts."[187] On the basis of this analysis of American case

177. *Id.* § 531(b).

178. (1997) 1 S.C.C. 388.

179. *Id.* ¶ 34.

180. *See id*. ¶ 19. This forested land happened to be "protected," *id*. ¶¶ 19(1), 36, and thus subject to a level of state protection under the Indian Forest Act, 1927, less stringent than that applied to certain other forests. *Compare* The Indian Forest Act, 1927, §§ 3–27, *available at* http://envfor.nic.in/legis/forest/forest4.html, *with id*. §§ 29–34 (regulating activities in reserved forests and protected forests, respectively).

181. 658 P.2d 709 (Cal. 1983).

182. *Id.* at 719.

183. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33.

184. 484 U.S. 469 (1988).

185. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33.

186. 484 U.S. at 472–81.

187. Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33. In this and related respects, the Indian Supreme Court misread *Phillips Petroleum*. The issue in that case was whether,

law the Indian Supreme Court concluded, "[w]e see no reason why the public trust doctrine should not be expanded to include all ecosystems operating in our natural resources,"[188] including "forests."[189]

upon its admission to the United States, the State of Mississippi acquired title to certain lands within its jurisdiction that were subject to the ebb and flow of the tide but not navigable in fact. 484 U.S. at 472. In holding that Mississippi had acquired title to these tidelands, the U.S. Supreme Court merely reaffirmed its long-standing rule that the constitutional equal footing doctrine, according to which new States acquire title to the submerged lands within their jurisdiction to the same degree as the original thirteen States did upon their independence from Great Britain, applies to all waters subject to the ebb and flow of the tide. *Id.* at 473–74, 476, 484–85; see also Pollard's Lessee v. Hagan, 44 U.S. (3 How.) 212, 228–30 (1845) (establishing the equal footing doctrine with respect to title to lands under navigable waters). These tidelands also happen to be subject to the traditional public trust doctrine. *See Phillips Petroleum*, 484 U.S. at 475–76, 476–80, 481, 484–85.

188. Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33.

189. *Id.* ¶ 34. The Indian Supreme Court's historical analyses of both the Roman law and the English common law were flawed as well. In identifying as an historical analog of modern environmental concerns the Roman law's *res communis* concept, which the court characterized inaccurately as "the 'Doctrine of the Public Trust'," *see id*. ¶ 24, the court asserted that the Roman concept was founded on the idea that "certain common properties such as . . . *forests*"—as well as rivers, the seashore, and the air—were "held by Government in trusteeship for the free and unimpeded use of the general public," id. (emphasis added). Similarly, after recounting the contributions of both the Roman civil law and the English common law to the development of the modern public trust doctrine, the Court asserted that "[t]he Public Trust Doctrine primarily rests on the principle that certain resources like air, sea, waters and the *forests* have such great importance to the people as a whole that it would be wholly unjustified to make them a subject of private ownership." *Id.* ¶ 25 (emphasis added). In fact, with respect to forests, the Roman concept merely protected the public's right to tie their vessels to trees growing on riverbanks that otherwise were protected as *res communis* lands. J. Inst. 2.1.4 (Thomas Collett Sandars trans., 1876). The English common law doctrine was of similarly limited scope. See BRACTON, supra note 45, at 40. As if realizing the weakness of its analysis on these points, the court went on to argue that American courts have expanded the scope of the public trust doctrine beyond both traditional trust resources and traditional public uses of those resources, *see* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 33, albeit partly in reliance on a misreading of the case law, *see supra* note 187 and accompanying text, and ultimately concluded that the Indian variant of the public trust doctrine applies to "the sea-shore, running waters, airs, forests and ecologically fragile land," at a minimum, Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶ 34; *see also id*. ¶ 33 ("We see no reason why the public trust doctrine should not be expanded to include all ecosystems operating in our natural resources.").

VI. CO_2 SEQUESTRATION AS A PROTECTED PUBLIC USE

A. CO_2 Sequestration in the United States

1. CO_2 Sequestration as a Public Use Protected by the Traditional Public Trust Doctrine

Although no American court has addressed the issue of whether CO_2 sequestration by vegetated lands per se is a public use protected by the traditional public trust doctrine, one court has recognized that protecting certain trust lands for their favorable impacts on climate is a protected public use. In *Marks v. Whitney*,[190] the plaintiff sought to quiet title to tidelands that he had acquired through a patent issued by the State of California.[191] The defendant was an adjoining, upland landowner whose access to the ocean would be cut off if the plaintiff filled and developed those tidelands as a marina.[192] In holding that the tidelands were burdened with a public easement imposed by the public trust,[193] the Supreme Court of California recognized that "[t]here is a growing public recognition that one of the most important public uses of the tidelands—a use encompassed within the tidelands trust—is preservation of these lands in their natural state, so that they may serve as ecological units for scientific study, . . . and as environments which . . . favorably affect the . . . climate of the area."[194] Although the court referred to the effect of these tidelands on the climate "of the area," there is nothing in its opinion to suggest that the court intended this modifier to exclude effects on climate generally. Of course, neither anthropogenic global climate change nor the ecological value of vegetated tidelands as CO_2 sinks were on anyone's mind in 1971 when the Supreme Court of California decided *Marks v. Whitney*.[195]

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190. 491 P.2d 374 (Cal. 1971).

191. *Id.* at 377.

192. *Id.*; *see also id*. at 381 (noting the plaintiff's plans to develop the tidelands as a marina).

193. *See id.* at 378–81.

194. *Id.* at 380.

195. *Cf.* ROSS W. GORTE, CONG. RESEARCH SERV., CRS Report RL31432, CARBON SEQUESTRATION IN FORESTS 5 tbl.1 (2009) (comparing the tons per acre of carbon sequestered in various biomes, including wetlands). Ironically, when both plants and soil are considered together, "wetlands" sequester much more CO2 than forests. *See id*.

2. CO_2 Sequestration as a Public Use Protected by the Federal Public Trust Doctrine

With respect to the national forests that comprise sixty percent of all publicly owned forests in the United States,[196] the MUSYA requires the Secretary of Agriculture to "develop and administer the renewable surface resources of the national forests for multiple use and sustainable yield of the several products and services obtained therefrom."[197] In relevant part, the statute defines "multiple use" as "[t]he management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people," and contemplates "that some land will be used for less than all of the resources[,] . . . with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output."[198] The United States Supreme Court has made clear, however, that in the event of a conflict between any of the uses identified by the MUSYA and the timber supply, water flow, or general forest and improvement purposes for which the national forests were established, the former must be subordinated to the latter.[199]

Significantly, the U.S. Forest Service has proposed a new planning rule under the National Forest Management Act to guide land management planning for all national forests in accordance with the principles of the MUSYA.[200] In relevant part, the intent of the planning

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196. *Cf. supra* note 32 and accompanying text (establishing the proportion of publicly owned forests in the United States comprised by the National Forest System).

197. 16 U.S.C. § 529 (2006).

198. *Id.* § 531(a).

199. *See* United States v. New Mexico, 438 U.S. 696 (1978).

200. National Forest System Land Management Planning, 76 Fed. Reg. 8480 (proposed Feb. 14, 2011) (to be codified at 36 C.F.R. pt. 219). In relevant part, the National Forest Management Act requires the Secretary of Agriculture to "promulgate regulations, under the principles of the Multiple-Use Sustained-Yield Act of 1960 that set out the process for development and revision of the land management plans" for national forests that the National Forest Management Act otherwise requires the Secretary to prepare. National Forest Management Act, 16 U.S.C. § 1604(g) (2006); *see also id*. § 1604(a) (requiring the Secretary of Agriculture to "develop, maintain, and, as appropriate, revise land and resource management plans for units of the National Forest System"). All current Forest Service land management plans are based on a rule promulgated in 1982. National Forest System Land Management Planning, 76 Fed. Reg. at 8481. Although the 1982 rule was replaced in 2000 with a new rule, which in turn was reinstated as amended in 2009 after a federal district court had invalidated two even newer rules on procedural grounds, the 2000 rule does not refer to climate change or carbon storage. See 36 C.F.R. pt. 219 (2011); see also National Forest System Land and Resource Management Planning, 74 Fed. Reg. 67,059, 67,059–67,060 (Dec. 18, 2009) (recounting the procedural history of the reinstated 2000 rule). Moreover, the transition

framework embodied in the rule would be "to create a responsive and agile planning process that informs integrated resource management and allows the Forest Service to adapt to changing conditions, including climate change."[201] The proposed rule would require each plan to provide for ecological sustainability, among other things, while taking into account "[p]otential system drivers, stressors, and disturbance regimes, including climate change."[202] It also would require each plan to provide for multiple uses, including "ecosystem services,"[203] which the proposed rule would define to include both "long term storage of carbon" and "climate regulation."[204] With respect to the development of plan components for integrated resource management, the proposed rule would require the responsible official to consider "[p]otential impacts of climate and other system drivers, stressors and disturbance regimes."[205] The proposed rule also would require the monitoring program for each unit of the National Forest System to include "one or more monitoring questions or indicators addressing . . . [m]easurable changes on the unit related to climate change and other stressors on the unit."[206]

Thus, the Forest Service clearly considers whatever public trust obligations have been imposed on it by statute to permit, if not necessarily to require, the management of national forests in a manner that takes climate change into account. The proposed rule seems to be much less concerned with managing forests for the purpose of mitigating climate change through CO_2 sequestration, however, than with managing

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provisions in the 2000 rule permit Forest Service personnel to continue to follow the 1982 rule until another rule is promulgated to supersede the 2000 rule. 36 C.F.R. § 219.35(b) (2011). The Forest Service anticipates that the units of the National Forest System will continue to follow the 1982 rule until the newly proposed land management planning rule is promulgated in final form. National Forest System Land Management Planning, 76 Fed. Reg. at 8482.

201. National Forest System Land Management Planning, 76 Fed. Reg. 8480, 8516 (proposed Feb. 14, 2011) (to be codified at 36 C.F.R. § 219.5(a)). Thus, the proposed rule would require a more holistic approach than the 1982 rule on which all current Forest Service land management plans are based, which instead of promoting integrated resource management focused on managing each type of resource individually. *Id.* at 8481, 8495.

202. *Id.* at 8518 (to be codified at 36 C.F.R. § 219.8(a)(1)(ii)). In relevant part, the proposed rule would define "system drivers" as "[n]atural or human-induced factors that directly or indirectly cause a change in an ecosystem, such as climate change." *Id.* at 8525 (to be codified at 36 C.F.R. § 219.19).

203. *Id.* at 8519 (to be codified at 36 C.F.R. § 219.10).

204. *Id.* at 8523 (to be codified at 36 C.F.R. § 219.19).

205. *Id.* at 8519 (to be codified at 36 C.F.R. § 219.10(a)(9)).

206. *Id.* at 8520 (to be codified at 36 C.F.R. § 219.12(a)(5)(v)); *see also* National Forest Management Act, 16 U.S.C. § 1609(a) (2006) (defining the scope of the National Forest System in terms of its constituent "units").

them for other purposes even in the face of climate change. The agency's views on these points are especially significant for federal public trust doctrine purposes given that the Supreme Court has made clear both that Congress has plenary authority to determine by statute how the federal trust in public lands shall be administered,[207] and that the courts must defer to federal agencies' own interpretations of the statutes that Congress has authorized them to implement as long as those interpretations are "reasonable."[208]

B. CO_2 Sequestration in India

No Indian court has considered whether the protection of public trust resources for their favorable impacts on climate is a protected public use. What the Indian Supreme Court has done, however, is manifest a clear concern for the ecological value of public trust resources, including forests, as well as a general willingness to expand the universe of protected public uses far beyond its traditional bounds. In holding in *Mehta v. Nath* that the State of Himachal Pradesh had violated the public trust doctrine by leasing protected forest land to a private company, the court repeatedly emphasized the forest's ecological fragility,[209] and in dicta clearly contemplated that the Indian public trust doctrine would apply to all "ecologically fragile lands."[210] In doing so, the court argued that ecological factors—apparently including ecologically defined public uses—should be used to identify which public resources are subject to the public trust doctrine in the first place.[211] Moreover, in declaring in *Reliance Industries* that the public trust doctrine applies to natural gas, the Court defined the public use value of the gas solely in economic and development terms,[212] which is well outside the universe of public uses traditionally protected by the doctrine.[213] If the Indian Supreme Court is willing to recognize mere economic or development value as a protected public use of a public trust resource, then there is little reason to believe that it would refuse to do

207. *See* Light v. United States, 220 U.S. 523, 537 (1911).

208. *See* Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 842–45 (1984).

209. *See* Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶¶ 22, 36.

210. *See id*. ¶ 34.

211. *See id*. ¶ 33.

212. *See, e.g.*, Reliance Natural Res. Ltd. v. Reliance Indus., SCC Civ. App. No. 4273, at ¶¶ 16–21 (May 7, 2010), *available at* http://judis.nic.in/supremecourt/chejudis.asp.

213. *Cf., e.g.*, *supra* note 64 and accompanying text (listing public uses that American courts have come to recognize as protected by the traditional public trust doctrine).

the same with respect to CO_2 sequestration by forests as a means of mitigating climate change in appropriate circumstances.

VII. CONCLUSION

Notwithstanding the challenging factual issues that any court would need to resolve in order to determine whether a publicly owned forest had been diverted to a use incompatible with its role as a CO_2 sink,[214] precedents exist for many essential elements of a public trust cause of action in support of that role in both India and the United States. American courts have applied the traditional public trust doctrine to publicly owned forests, albeit not in upland contexts,[215] and have recognized the protection of certain trust lands for their favorable impacts on climate as a protected public use.[216] They also have applied the federal public trust doctrine to federally owned forested lands in appropriate statutory contexts.[217] The U.S. Forest Service, which manages sixty percent of all publicly owned forested lands in the United States, has proposed to consider their value in mitigating climate change in its land management planning for national forests, thus making clear that the agency considers any public trust obligations imposed on it by statute to permit, if not necessarily to require, the management of those forests for CO_2 sequestration purposes.[218]

Although fewer precedents exist in India than in the United States for essential elements of a public trust cause of action in support of publicly owned forests as CO_2 sinks, India probably offers a more fertile field for realizing their full potential, at least in the near term. Although the Indian Supreme Court has not considered whether CO_2 sequestration is a protected public use of trust resources, it has applied the public trust doctrine to publicly owned forests,[219] has recognized the protection of ecological values as a purpose of the public trust,[220] and has demonstrated a willingness to define the universe of protected public

214. *See generally* GORTE, *supra* note 195 (analyzing what is known and not known about carbon cycling in forests and about how land use changes, forestry management practices, and other factors affect their role as CO2 sinks).

215. *Supra* notes 149–66 and accompanying text.

216. *Supra* notes 190–95 and accompanying text.

217. *Supra* notes 167–71 and accompanying text; *cf. supra* notes 172–77 and accompanying text (arguing that the most important statute with respect to the application of the federal public trust doctrine to forests makes clear that the Federal Government has a fiduciary duty to manage the national forests for the public's benefit).

218. *Supra* notes 200–08 and accompanying text.

219. *Supra* notes 178–89 and accompanying text.

220. *See supra* notes 209–11 and accompanying text.

uses in ways that go far beyond traditional bounds.[221] It also has demonstrated a willingness to adapt American precedents to its own purposes,[222] if sometimes interpreting their implications more liberally than the precedents themselves warrant,[223] thus making cases like *Marks v. Whitney*, in which the Supreme Court of California recognized the protection of certain trust lands for their favorable impacts on climate to be a protected public use,[224] to be freely available for use in filling the gaps in Indian jurisprudence. Given sufficient interest on the part of Indian courts, their freewheeling style of jurisprudence[225]—especially when combined with their constitutional authority to assert jurisdiction, on their own initiative, over nearly any matter that interests them[226]—would enable them to mobilize the public trust doctrine in support of publicly owned forests as CO_2 sinks without much further ado.

221. *See supra* notes 212–13 and accompanying text.

222. *See, e.g.*, Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶¶ 26–29, 32–33; but cf. supra notes 127–37 and accompanying text (arguing that Mehta v. Nath, (1997) 1 S.C.C. 388, and its progeny manifest an ongoing shift away from the Indian Supreme Court's initial reliance on American law as the touchstone for the content of the public trust).

223. *See supra* notes 184–87 and accompanying text.

224. *Supra* notes 190–95 and accompanying text.

225. *Cf. supra* notes 106, 181–89 and accompanying text (analyzing a decision by the High Court of Jammu and Kashmir and its possible impact on the Indian Supreme Court's understanding of the source of the Indian public trust doctrine, and analyzing the Indian Supreme Court's reasoning in Mehta v. Nath, (1997) 1 S.C.C. 388, at ¶¶ 24–25, 33–34, with respect to the scope of the doctrine).

226. *See* INDIA CONST. arts. 142, 226; *see also* Razzaque, *supra* note 106, at 230 n.23 (pointing out that actions initiated on Indian courts' own initiative are known as *suo motu* actions). For example, the Indian Supreme Court initiated Mehta v. Nath itself in response to a newspaper story about the construction project at issue. *See Mehta v. Nath*, (1997) 1 S.C.C. 388, at pr. para. 2.