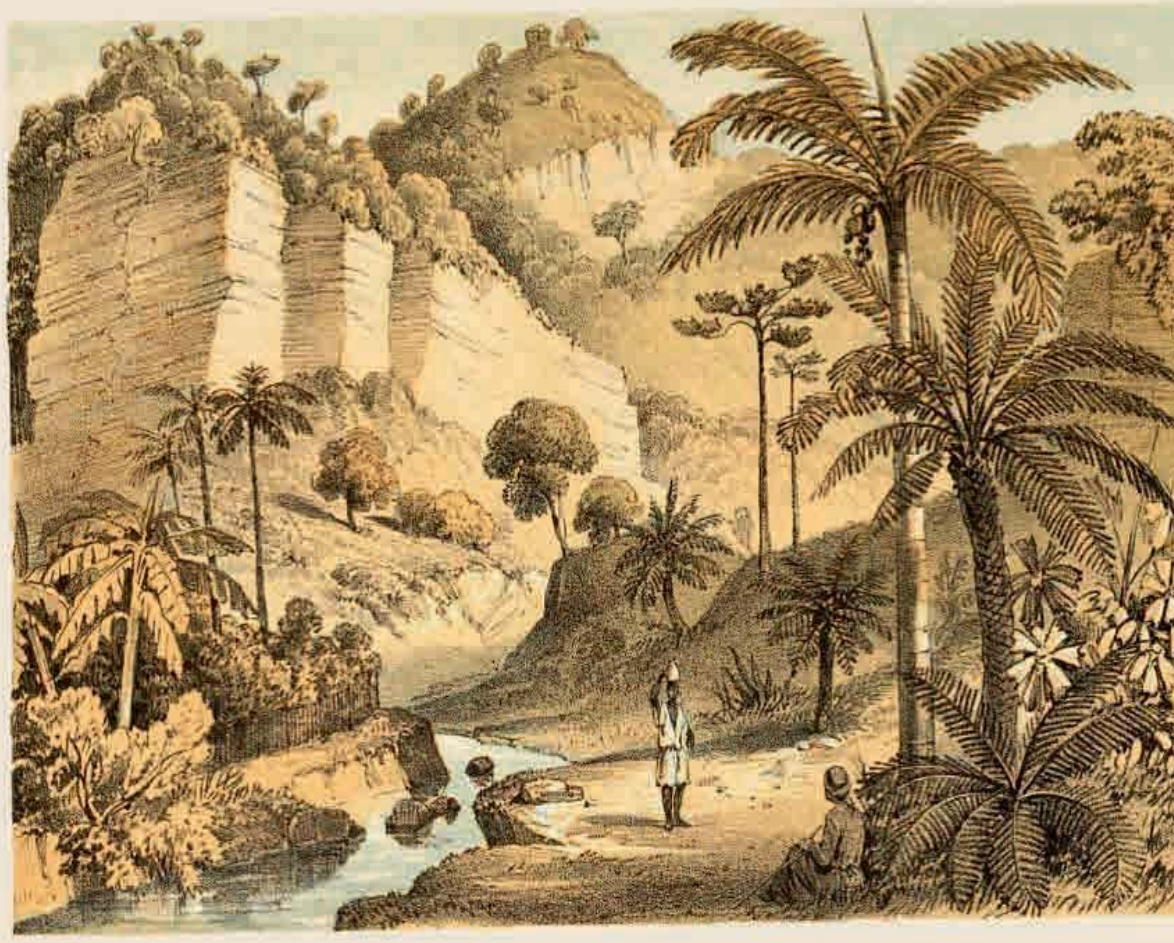
PRIMUS

COMMONWEALTH FORESTRY & ENVIRONMENTAL HISTORY

Empire, Forests and Colonial Environments in Africa, the Caribbean, South Asia and New Zealand

Edited by
Vinita Damodaran
Rohan D'Souza



EDITORS

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Contemporary anxieties about global warming and climate change impacts have unsettled the ways in which we think about environmental politics and human history. Intense discussions have already begun over whether we need to reconsider what we understand by the term 'environmental change' and if humans have truly become a 'geo-physical' force. Put differently, how should we recast our understanding of the planet's varied environmental pasts in order to make sense of the Anthropocene present?

This collection of 19 essays on forestry and environmental change in the erstwhile colonies of the British Empire—today comprising the 'Commonwealth of Nations'—builds on Richard Grove's quest for achieving a 'global synthesis' as efforts towards writing environmental histories on a planetary scale. The Commonwealth of Nations as a single environmental bloc for study, enquiry and historical scrutiny, explores connected environmental histories, compares dissimilar ecological regions and debates ideologies for environmental management.

Commonwealth Forestry and Environmental History is intended to enable conversations between environmental historians, foresters, sustainable development practitioners, policy makers and those keen on understanding contemporary politics brought on by concerns about climate change.

Jacket front: 'Seetakoond Hill' by Joseph Dalton Hooker, 1854'.

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PRIMUS BOOKS

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Foreword

P.P. Bhojvaid

It was during British colonial rule that organized scientific forest management was first established in the Indian subcontinent. As is now widely noted in several academic monographs and in official published records, the forest department in British India was set up in 1864 with the appointment of Sir Dietrich Brandis as the first Inspector General of forests.

The legacy still lives on 150 years later through the continuance of various protocols and institutional arrangements such as the Indian Forest Service, working plan codes, Forest Research Institute, silvicultural systems and the Reserved and Protected notified forest areas.[1] The forests, which comprise the assets of the Indian Forest Department, now cover 78 million ha. and represent 22 per cent of the nations' geographical area.[2] While the advent of colonial forestry was marked by timber primacy, revenue generation and sustained yield; the forestry in vogue in independent India is characterized by ecological security, landscape approach to management, conservation of biodiversity with people's participation and oriented towards achieving sustainable forestry. Thus, we can argue, that there is paradigm shift in the forest management strategy in independent India in which the effort is to accept 'multiple values of conserving forests: ranging from ecosystem services (including carbon sequestration), Non Wood Forest Produce, and Biodiversity conservation, rural employment and for meeting goals for poverty alleviation.' Moreover, in the last five decades, one has also witnessed the evolution of more than twenty-five international instruments that are associated with realizing management imperatives for forestry. In this foreword, I will explain some interacting agents of change that are shaping forest transition in India (See Appendix: Fig. 1)

and subsequently briefly reflect on some of the new forest conservation agendas that have begun to both build upon India's colonial forest legacies and yet also move much beyond them such as agroforestry and the recent turn to JFM.

The trends for over a century in India indicate that forest areas have been in continuous decline from 1900 to at least the early 1970s.[3] This decline in India's forests have been variously attributed to increase in population; the expansion of the railways during the nineteenth and early decades of the twentieth century;[4] and the needs of the two world wars and forest conversion for agriculture to feed teeming millions[5] (See Appendix: Table 1 and Table 2). The use of *Sal* and *Deodar* for railway sleepers and unregulated cutting of trees for wars were particularly damaging. Forest regulations and policies formed during the British Empire caused the expropriation of vast tracts of forests and turned into government property and the consequent alienation of the local people and communities from their historical access.[6] Consequently, all concessions and rights that were not explicitly granted by the state were withdrawn; paving the way to facilitate absolute control of the State over forest resources. Moreover, the objectives advocated in the first forest policy in India in 1894 could not be implemented in all categories of forestlands and its application was limited to the supply of valuable timber from India to England for the imperial strategic and commercial interests. Some of the efforts made under the scientific management of forests under the concept of sustained supply of timber; could not make a mark on the overall condition of forests in the country and the subsequent two world wars further deteriorated the forests of India due to over exploitation of timber (See Appendix: Fig. 2).[7]

The new forest policy of 1952 after India's Independence recognized the functional classification of forests as: (a) protected forests for environmental consideration; (b) national forests for strategic requirements of defense; (c) communications and industry; and (d) village forests for local needs. Apart from these functional forest types, lands for extension forestry to meet the growing needs of the people were also recognized.[8] It was also recommended that 33 per cent of the total geographical area of the country should be put under the forest cover. Large areas were thus declared as notified forestlands and forest consolidation took place in the first two decades after Independence. Though the extent of notified forests showed continuous increase due to inclusion of more land into the category of legal forests, the status

of forests in terms of forest cover in the country showed continuous decline.

During 1950–1, the forest area in India was documented as being 40.48 Mha. It increased to 66.80 Mha. in 1976–7 and 76.52 Mha. in 1996, i.e. an increase of 36.04 Mha. However, the intervening period also witnessed large scale tree felling by private owners to get maximum returns from whatever existing tree cover was on their properties, before being acquired by the government as national property. Forests, being legally on the provincial/state list under the 'separation of powers between the provincial and central governments', continued to be diverted recklessly for all non-forestry purposes. Moreover, large scale developmental activities were initiated immediately after Independence leading to a rapid industrialization (including the production of paper, plywood and saw milling), expansion of railways, network of highways and road broadening; varied construction activities; river valley hydro projects; expansion of agriculture, etc., claiming large areas of forests (nearly 4.13 Mha. until 1976).[9] Forests were thus considered a land bank for meeting the land needs for other land use purposes and a resource for earning revenue. Further, the subject 'Forest' was legally brought under the concurrent list of the Constitution from the State subject by the 42nd Amendment of the Constitution in 1976. Subsequently, a Central Act—Forest Conservation Act of 1980—was enacted to regulate the diversion of forest land for non-forestry purposes. It is important to mention here that prior to the enactment of the Forest Conservation Act 1980, the diversion of forestland for non-forestry purposes during 25 years (1951–76) was 4.13 Mha. about 60 per cent of which was for agricultural purposes. Before the Act came into force, the diversion rate of forest land was 1,65,200 ha./year which came down to 36,560 ha./year after the enforcement of the Act.[10] A new National Forest Policy was promulgated in 1988. It marked a major departure from the 1952 policy by laying prime emphasis on environmental stability and conservation of forests. Furthermore, the new policy laid emphasis on meeting the domestic requirements of fuel wood, fodder, minor forest produce and construction timber for rural and tribal population and their participation in protection and management of forests. Consequently, the forests were no longer a source of revenue for finance required for development activities.[11] While earlier the focus was on sustainable harvest of timber and earning revenue, in the new policy importance was now given to the conservation of natural heritage in the country by

preserving natural forests with their vast variety of flora and fauna and rich genetic resources (See Appendix: Fig. 3).[12]

Participatory arrangements have existed in Indian forestry since long in some form or the other. However, these were formalized with a declaration from the Ministry of Environment and Forests (GoI) in June 1990, which provided to the state governments a framework for the involvement of village communities in protection, regeneration and development of degraded forests situated in the vicinity of the forest villages. This structured JFM strategy has been in operation for almost twenty years and till March 2010, an area of 24.6 Mha. has been brought under the JFM regime.[13]

It must also be noted that as a consequence of the enactment of the Forest Conservation Act of 1980, the Forest Policy of 1988 and the subsequent intervention of the Supreme Court of India in 1996, four defining features of the current situation becomes obvious—presently there is a ban on felling of trees in all forests over 1000 m. altitude; high priority has been given for raising fuel wood and leaf fodder producing trees in the government forests resulting in almost complete exclusion of devoting forests for industrial trees; industrial wood production has been restricted to only on-farm lands or on waste lands; and a ban on all operations in national parks and sanctuaries has been imposed.

All these factors have resulted in the decline of efforts to extract timber production from natural forests. Alongside, however, there have been increased plantations in various agroforestry models in some agricultural zones of the country (See Appendix: Table 3 and Fig. 4), which is intended to meet demands for wood based industries. Interestingly, the wood from eucalyptus, poplars and casuarina have been declared as agricultural produce and is now being marketed through the agricultural market committees and even enjoys exemption from federal income tax.

In brief, there has been a major shift in the very purpose of managing forests and their uses. While earlier the focus was on how to harvest timber sustainably and regenerate major timber species, now forests are to be conserved for their biodiversity and ecosystem services and particularly for carbon sequestration. In the present conservation strategies, local people depending on forests for their subsistence living are considered very much a part of forest management. While earlier the forests were regarded as a revenue source the government is generating finance to reduce forest degradation and conserve biodiversity and

enhance ecosystem services. India must perhaps be amongst the few developing countries in the world which pays compensation to states with higher forest areas for providing ecosystem services to the rest of country.[14] Importance has also been given to the eradication of invasive alien species like *Lantana camara*, which have spread in much of the degraded forest areas of India and are regarded as a threat to biodiversity and regeneration of native species.[15]

In India, until the 1970s natural forests were widely considered to be the main source for timber. The total production of timber from forests was about 10 million cu. m. per year although the country's requirement was estimated to be about only 15 million cu. m. (NCA 1976). Part of the requirement was met by harvesting trees from private lands outside the main forest zones. The National Forest Policy 1988, however, redirected the emphasis towards the conservation of forests and biodiversity and discouraged efforts to treat natural forests as merely being a reservoir for timber. The annual production of timber from forests had declined to about 4 million cu. m. by 1990 (See Appendix: Fig 5). In view of the increasing emphasis on conservation of forest, the GoI took a policy initiative in 1996 to liberalize the import of wood and wood products by bringing wood/timber under Open General License (OGL) category to reduce the demand-supply gap and protect existing forests. Since then the import of wood and wood products has been steadily increasing (See Appendix: Fig. 6). The current level of import of wood is about 6 million cu. m. of which round logs alone constitute more than 93 per cent. Teak constitutes an important timber species and forms about 15 per cent of the total annual imported volume. Most of the imported teak is from Myanmar, the Ivory Coast, Ghana, Ecuador, Costa Rica and Benin. The value of the imported wood and wood products has gradually increased from Rs.33,220 million in 2003–4 to Rs.76,880 million in 2009–10, which is approximately $6 billion as of 2017. However, such trends in import may result in further deforestation and degradation of forests in poor and emerging economies.[16]

The National Commission on Agriculture in its interim report in 1976 had emphasized the importance of production forestry (man-made forests) and recommended the creation of Forest Development Corporations in different states for enhancing the investment through bank financing and raising of large scale plantations through social forestry. The report of the commission was instrumental in promoting large scale social forestry programs in India. Subsequently, India has

had large scale social forestry programs with the aim of producing fuel wood, fodder, small timber and other products from the plantations on wastelands, degraded forests, private marginal lands, village common lands and agricultural farms (See Appendix: Fig. 6). These efforts were made with general assistance from externally aided projects from donor agencies such as the World Bank, Swedish International Development Cooperation Agency (SIDA), Danish International Development Agency (DANIDA), Department for International Development (DFID) and the Japan International Cooperation Agency (JICA), to meet the needs of rural communities. In the first three decades after Independence, i.e. 1950–80, the total plantations done by the State forest departments was 3.54 Mha. with an investment of Rs.2,400 million, while in the Sixth Five Year Plan (1980–5) alone, 4.64 Mha. of plantations was raised with an investment of Rs.9,260 million. This substantial increase was due to internationally aided social forestry projects. Plantations were established outside forest reserves on wasteland owned by the governments and communities on private lands. It was estimated that 5.94 Mha. of public lands were covered under block plantation and 2.92 Mha. were covered in private areas.[17]

During the Ninth Five Year Plan (1997–2002), a flagship program of the central government under the name of NAP was launched to institutionalize people's participation in project formulation and implementation. The FDA was constituted in all the districts of the country as an autonomous federation of the JFM committees and registered under the Societies Act 1860 is the implementing agency at the divisional level. Large scale plantation continued with the onset of the NAP and support from the Twenty Point Programme (TPP) through Forest Development Agency (FDAs) in all districts of India.[18]

The discussions in the preceding sections indicate that the policy and legal framework provided active support for the conservation forestry in the form of acts, afforestation/social programs and the judicial interventions of the Supreme Court of India. This has also resulted in changes in attitude toward forests, usage of forest products, interface between forests management practices and formal evaluation and social security mechanism and thereby significantly contributing towards a forest management transition in India. In the recent past, the 'Green India Mission' (GIM) of the Ministry of Environment & Forests of GoI has set a target of creating an additional 5 Mha. plantations in the country outside that of the forests by 2020. This strategy is intended to

be part of a mitigation option in the context of climate change. Since 1988 India has signed many international instruments which, in fact, mandate sustainable forest management in India. Consequently, the forest policy of 1988, the GIM document and National Climate Change Action Plan of GoI require synergy to facilitate most of the forest cover of the nation. It has become essential, therefore, that work is initiated to revise the forest policy of 1988 to accommodate such interventions.

Critically as well, in my opinion, the struggle for ethics around sustainability will become pressing as we begin to understand that forests can no longer be managed only as a resource for unrestrained economic growth. Many now, in fact, believe that society is in another period of transition to a new era of holistic management. The forces triggering change in today's society are scarcity, acknowledgement of limits to growth and the global economic and ecological interdependence of all countries. Increasing populations, material consumption and unrestrained economic growth has created an ever increasing demand for forests and their products. The belief in exhaustible forest resources and the ability of science to increase yield to keep pace with unrestrained economic growth has been seriously questioned. The Brundtland Commission brought international attention to the notion of limits to growth (1987) and it is now widely recognized that unrestrained economic growth is not possible without exhausting our natural resources and resulting in severe environmental degradation.

Nation-states are no longer autonomous entities able to establish their own policies and direct their own economy. The market economy has globalized and economic policies are influenced by the need to compete in order to achieve wealth but, on the other hand, global warming, ozone depletion, pollution, and loss of biodiversity do not know nation boundaries. Countries are globally interdependent both economically and environmentally. Preserving old growth forests in North America may simply increase exploitation elsewhere such as in Siberia or the Tropics or result in the substitution of less environmentally friendly products such as aluminum, steel and concrete.[19] Transferring environmental impacts geographically will not solve the problem and may, in fact, make the global situation worse. No country is exempt, even the wealthiest.

Individual countries are no longer able to take action on their own as it may place them at a competitive disadvantage. A global solution and strategy is therefore required and is in the interests of all countries. The UNCED conference in Brazil in June 1992 was a start in developing just

such a strategy and the work must continue. The broad and vague concept of sustainable development must be debated, defined and implemented within today's social, economic, political and ecological context. It must be translated into meaningful and implementable forest accords, multilateral agreements and policies that are practical and yet address the root causes of resource depletion. Sustained yield is no longer a technical concept applied by forest engineers, biologists and economists, it is a social, economic, political, cultural and ecological concept that will shape the unfolding of human history.

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Opening Remarks at Nehru Memorial Museum & Library

Richard Grove

It is two hundred years since Nathaniel Wallich started his career as an East India Company scientist and twenty years since the Governor-General of Bengal as a representative of the Company made its first reflective statement on the likely usefulness of science—as they alleged to uplift the poor Indian cultivator and enrich the Company. It is just over a hundred years since the first two major overviews were made of research into the natural world of Asia conducted by the Company, that essayed in 1878 by Sir Clements Markham, that remarkable gay explorer and scientist of tropical Asia and the frozen Antarctic, an academic reached rivalled among my own acquaintances only by Piers Vitebsky's researches on the Sora of eastern India and the reindeer herders of Siberia. I am afraid I've only got as far as living in a cave in Iceland and that was a long time ago in 1975. The second major overview of research into the natural world by the Company was that made by the Asiatic Society of Bengal in 1883. With the exception of the useful essays by Deepak Kumar and Satpal Sangwan, who certainly set an agenda for the topic, the time is well overdue for a considered new start at trying to assess the scope and the significance of the intellectual and practical interactions between the Company and its natural environment over the century of its rule as a territorial state. The long perspective we have now on that century actually gives the task more relevance and, I think,

Introductory Remarks at the Seminar 'Nature and the Raj: Colonial Environments and Indigenous Knowledge' by Richard Grove at the Nehru Memorial Museum & Library, New Delhi, August 2006.

poignancy. This conference is not actually the new review that is overdue, but it is a start at looking at the topic in the round. The original intention was to confine the meeting to the Company period, but the paucity of scholars who have chosen to confine themselves to that period meant that as a first glance it was worth thinking in more general terms about the longer period of British rule and its interactions with the natural. So what is the particular poignancy of which I spoke? I think it is this. What distinguished the Company from the later period of colonial rule (which was I think far more arrogant and confident in its assumptions, just as its successor the Indian state is today), was its much greater predisposition to fear and to be aware of its vulnerability to extreme natural events of flood, drought and disease in particular and to the exigencies of natural hazards for which the records were only embryonically developed. As Markham noted, some of the most assiduous collecting done by the Company, apart from collecting botanical and zoological specimens, was the collection of meteorological data on temperatures, pressures and rainfall, and on flood and cyclone events in particular. This vast array of collected data, formidable already by 1857, has never been used significantly by scientists since and its value is only just now beginning to be recognized. And the reason for that is that just the Company was faced by natural hazards which it was far from confident it would survive in the long term, I think as a global society (although I should say this awareness is not shared by a majority of governments) we are no longer arrogant about our prospects of surviving extreme natural events. We feel our vulnerability to global warming and powerful El Nino events and begin to understand the part played by humans in destabilizing the natural environment and the atmosphere to a dangerous extent. And there is little doubt that the scientists of the Company (and incidentally the early Australian colonies) with their early but effective instrumentation and more importantly their highly developed global networks of information, knowledge, and collection were the pioneers in bringing about a new intellectual anxiety about the environment and a fundamental questioning of human hubris. I am afraid little attention was paid to their warnings and we now find ourselves in a much more serious situation. As Sir David King, The British Government Chief Scientist pointed out in 2005, the danger from climatic change is much more serious than terrorism. The war on terror he wrote was an invidious construct which indeed it is, and a serious distraction from tackling the real problems at hand. He might have learnt a lot from the warnings of over a century ago; that it is

only after major disasters that governments listen to scientists and even then not for long. The tensions between the insights and prescriptions of science and the apparent imperatives of economic development are still great despite the overwhelming evidence of environmental dangers ahead. It has been argued that being an environmental historian, which many of us here are, is rather like being a journalist sitting on a deckchair on the Titanic as it begins its last long slide to destruction; at least we can document disaster. And there is little question that the scientists of the Company found themselves documenting one disaster after the other. They certainly lived in a horrendous disease environment. The correspondence of Wallich that I have examined, is full of letters with black edges, the constant drip-drip of news of the deaths of young contemporaries, quite apart from the more general news of famines, must have been a constant reminder of their own mortality and the sense of urgency to a complete a scientific investigation seems to have driven many of them to obsessive efforts—it certainly did so in the case of Wallich, especially after his Burmese expeditions. So if we are the documenters of our own environmental and actual global demise, we can make a good start on examining the pioneers in the field and examining the impact of the state that produced them on the natural world of South Asia and its peoples. The mere collection of data and specimens did not always lead to insights. The Asiatic Society began in the late 1830s a long programme of research led by Henry Piddington on the mechanism of cyclones. But despite twenty-five years of data collection and more than thirty published papers documenting his data collection, Piddington managed to make no worthwhile deductions at all about the causes of cyclones. But at least he collected the data and due to his dogged determination to collect natural data we are now in position to make use of it, even if, as the ice core scientist Lonnie Thompson tells us, it is now too late.

Introduction

Vinita Damodaran and *Rohan D'Souza*

Anxieties about global warming and climate change impacts are unsettling many a standard view in politics, economics, history and environmentalism.[1] Within the arc of this intellectual turn, unsurprisingly perhaps, intense discussions have already begun over whether an increasingly chaotic and unpredictable climate will require us to profoundly reconsider what we mean by the notion of 'environmental change' and whether human beings can remain as 'biological entities'.[2] These deliberations, in fact, have acquired considerable urgency in recent years; more so given that radical ecological perturbations, surprises, disturbances and a dramatic rise in extreme climate events are expected to become the norm.[3] It is amidst these fresh concerns brought on by the context of climate change that in 2008 the Stratigraphy Commission of the Geological Society of London was approached with a novel proposal. The proposers claimed that a number of current environmental indicators such as biodiversity loss, changing composition of the atmosphere, increase in the ocean's average temperatures, thinning of the Arctic ice, and a perceptible rise in global sea levels strongly suggest that planet earth might no longer be within the environmental variability of the Holocene epoch (approximately 11,000 years previous to the present).[4] The new geological unit of time, thus, it was argued, should be more aptly termed as the epoch of the Anthropocene: which acknowledges that planet earth has moved beyond the climate and ecological conditions of the Holocene and that humans have 'become a global geological force' that are comparable in scale to those brought on by super volcanoes, meteorites crashing or massive seismic rumblings.[5]

Interestingly enough, the Stratigraphy Commission deemed the proposal worthy for further examination and subsequently set up several working groups comprising scientists who were tasked to determine whether the Anthropocene could indeed be formally accepted as a new geological time scale. While this scientific assessment is yet to be concluded at the time of the writing of this introduction, many scholars, academics and popular writers have, nonetheless, already begun a loud and active debate over the possible and potential political, social and environmental implications of the Anthropocene.[6] More so now, given that in this human-dominated epoch radical and unprecedented 'uncertainties' will engulf the natural world in 'novel climates, no-analog ecological communities and ecological surprises'.[7] Rather than standard environmental narratives about deforestation, pollution or environmental degradation, therefore, today's environmental quest will need to be even more attentive to how biological, ecological and social processes are sustained in order to maintain the conditions for life on planet earth.

In step with this new mood, Johan Rockstrom et al., in a widely cited paper in 2009, advanced a striking formulation termed 'planetary boundaries': defined as the critical biophysical thresholds for the 'earth system' within which, according to the authors, lies the 'safe operating space for humanity'.[8] In their estimate, environmental sustainability in the epoch of the Anthropocene implies maintaining/sustaining 'planetary boundaries' instead of the previous emphasis on establishing resource limits or the problem of environmental scarcity. For Johan Rockstrom et al., in fact, out of a total of ten integrated and interlinked planetary boundaries that were identified in their paper, three of these thresholds they believed were already dangerously crossed. These discussions about the Anthropocene and planetary boundaries, besides debating the issue of geological time, were also, in our opinion, emphasizing the urgency for reconsidering problems of spatial scale. Narratives about climate change impacts, thus, as many have begun to underline, need to find appropriate spatial scales that help us credibly track and understand environmental change in contemporary times. On the one hand, the idea of the global or planetary level has become increasingly critical to grasp how climate change impacts are altering previous ecological relationships; on the other, it is equally important that the implications for local contexts and place-based environmental settings are more carefully drawn out and understood. Writing compelling environmental narratives about global warming and climate change thus needs us to capture within a single frame how 'global facts' interact with 'local values'.[9]

In effect, we must consider writing environmental histories as a 'nature without borders'.[10] And in such a fresh reorientation, we could reconsider the centrality of the nation-state as the basic unit for studying environmental change. In sum, contemporary environmental history writings, we argue, are increasingly being compelled to go beyond the nation-state as the scale and unit of analysis. Instead, the felt need is to seek larger and even more sprawling chunks of the environment to be placed under a single analytical lens for writing truly global environmental histories which, on the reverse, will further illuminate and sharpen our understanding of local ecological contexts. Put differently, whilst the bird-eye view allows us to grasp general patterns from a great height, it is equally critical that the toad's tactile sense of ecological realities on the ground are drawn in to complete a more meaningful and wholesome picture of environmental change.

Environmental History beyond Borders

Donald Worster sums up global environmental history as the effort to 'take an all-inclusive view to see the world as a whole and to study the planet as a single environmental system that has been radically reorganised by a single, integrated economy, technology and culture.'[11] For John McNeill, on the other hand, going global 'should include both microscopic and macroscopic lenses and provide local examples or case studies together with larger analyses and conclusions.'[12] Here, clearly,

MAP 1: The British Empire at its peak in 1921.
Source: https://commons.wikimedia.org/wiki/File:British_Empire_1921.png.

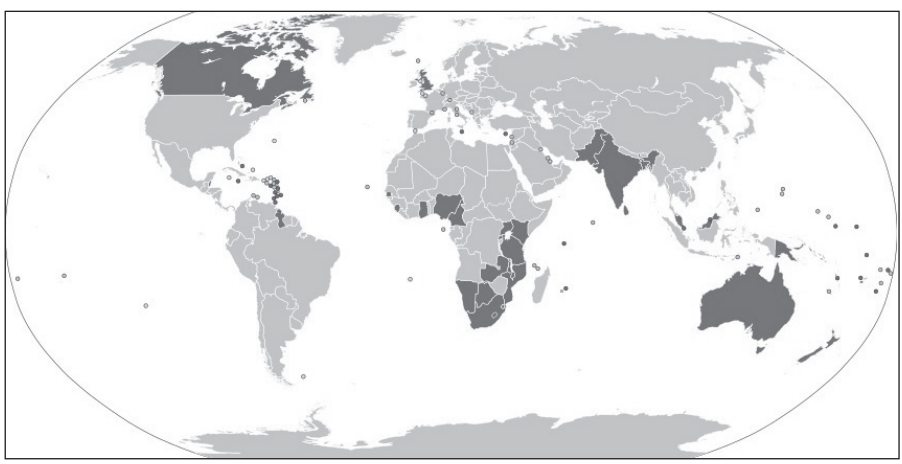
we have two pioneering scholars in environmental history telling us that finding the appropriate scale for historical analyses invariably also requires us to understand that narrative tensions are created between the global and local. Going beyond national borders, in other words, does not automatically make the case for a global history.[13] Rather, our effort in this volume is to argue for a meso-level environmental history by which a conceptual ground is found between the nation-state and the global scale. Such efforts have, in fact, been attempted earlier as well.

Richard Tucker's much celebrated *Insatiable Appetite*, for example, meticulously traces the enormous environmental footprint of the United States (US) beyond its political borders. *Insatiable Appetite* describes how American consumption demands from the 1900s ended up fuelling or aggravating ecologically devastating processes in much of the tropical world. While the quest for cheap beef and instant coffee resulted in the deforestation of immense swathes of Amazonian forests in Latin America, 'Yankee fruit companies' like United Fruit met the United States' requirements for bananas by turning richly diverse tropical ecologies into simplified monocultures. Similar stories unfolded in rainforests in Africa with American companies like Goodyear and Firestone sourcing huge quantities of crude rubber by promoting plantations in countries such as Liberia (West Africa) in order to manufacture car tyres for a rapidly growing US automobile industry. Tucker, in *Insatiable Appetite*, in effect, opened up the possibilities for mapping the extensive transnational and global production and consumption networks that though emerging from the US intensely played out in terms of their impact across local environments in the tropical world.[14] William Beinart and Lotte Hughes in *Environment and Empire* offer another route to explain and challenge the limits of 'national units'. The British Empire, for these authors, served as a helpful temporal and territorial/ecological unit for exploring a range of environmental themes: (*a*) environmental impact; (*b*) causation with regard to ecological degradation; (*c*) projects for colonial conservation; and (*d*) systemic environmental change brought about by British rule.[15] The authors, however, were careful to list a number of caveats to their effort. Chief amongst these was the fact that the British Empire during the course of its expansion, consolidation and ultimate dissolution on the world stage (from the 1600s to well into the mid-1900s) kept evolving its environmental agendas, conservation interests and plans for resource extraction. Nonetheless, a cogent, consistent and defining environmental imprint of the British Empire can still be discerned in aspects such as

scientific forestry, carnivore control, extension of the arable through commercial monocultures and modern perennial irrigation, to name a few examples, across South Asia, Africa, The Caribbean, Australia and New Zealand. Deepak Kumar, Vinita Damodaran and Rohan D'Souza, in an edited volume titled *The British Empire and the Natural World*, in fact, similarly sought to discuss the Empire's many varied environmental impacts across South Asia by arguing for de-centring the idea of the nation-state in environmental history narratives.[16]

Commonwealth Forestry and the 'Global Synthesis'

In a little remembered piece published in the journal *Nature* in 1952, E.P. Stebbing (1872–1960), formerly of the Indian Forest Service and then at the Forest School at Edinburgh University, succinctly reiterated what he believed to be the historical beginnings of forest conservation in British India.[17] Accordingly, in the brief article, Stebbing put forward the claim that the need for 'forestry'—the scientific management, administration and maintenance of forests—arose as a response to the havoc wreaked upon British India's once well stocked forests by the combined demand of local communities and the colonial government. Consequently, from the early half of the nineteenth century, the then East India Company government began the exercise of appointing 'conservators' in several



MAP 2: The Commonwealth of Nations at the time of publication.
Source: Member states of the Commonwealth of Nations.svg, By Rob984 (Derived from File:BlankMap-World-Microstates.svg) [CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0)], via Wikimedia Commons.

provinces, who were tasked to prevent the unchecked, and what they held to be the wasteful, cutting of trees. In 1855, the Governor-General Lord Dalhousie (1848–56) finally enunciated 'The Charter of the Indian Forests'[18] and in the next year itself, in 1856, Dr Dietrich Brandis (1824–1907), a forester trained in the German forestry tradition, was appointed as the Superintendent of Forests in Pegu (Burma). Following Brandis' appointment, in Stebbing's opinion, modern forestry finally began its long legal, technical and bureaucratic journey in the South Asian subcontinent. Notably, the setting up of the Indian Forest Department (1864), enacting the early Forest Acts (1865, 1875 and 1878) and, finally professionally training the first foresters.[19]

Stebbing's efforts to write up an 'origin story' for modern forest management in British India was amongst the first on the subject. His article in *Nature* was also rounded up with several short synoptic reviews of forestry programmes in the British dominion countries (Canada, South Africa, Australia, and New Zealand) and in the five geographical zones of the colonies which were grouped as the Caribbean, West Africa, Central and East Africa, the Malay Peninsula and Archipelago, and the South-West Pacific Islands.

At heart, however, these rolling glances of Stebbing at forestry practices across continents and countries to the idea of the territorial boundaries of the British Commonwealth. In effect suggesting that while modern forestry was a truly global endeavour, much of its emergence and consolidation lay in the common experiences and distinct histories within the geographical contours of the British Empire; which with the Statute of Westminster in 1931 was morphed into the British Commonwealth or the Commonwealth.[20] The idea of the Commonwealth was further evolved in 1949 with the London Declaration that announced a changed membership criterion that now allowed membership to fully independent countries rather than only dominions. This was a direct result of India's interest to remain a Commonwealth member, despite its recent independence in 1947. The British Commonwealth or Commonwealth was, however, changed to the 'Commonwealth of Nations' in order to mark a distance from the ideologies that gave legitimacy to the founding ideas of the British Empire.[21]

The current Commonwealth of Nations as an intergovernmental organization is made up of 52 countries, covering more than 2,99,58,050 sq. km (1,15,66,870 sq. mi.). That is, in total, these countries make up

a quarter of the world's land area and span across all the six inhabited continents. This large slice of the earth is further inhabited by an estimated population of 2.4 billion, which amounts to nearly a third of the world's population. Moreover, the Commonwealth of Nations in 2017 is estimated to produce a nominal gross domestic product (GDP) of $10.4 trillion—representing 17 per cent of the gross world product, when measured in purchasing power parity (PPP), and 14 per cent of the gross world product when measured nominally.[22]

For the purposes of this volume, the British Commonwealth or Commonwealth as an environmental context offers us a compelling conceptual template for assembling narratives that help us capture, in particular, an unprecedented moment for understanding environmental change and modern forest management..[23] The British Commonwealth or Commonwealth (1931–48), we note, was bookended between two distinct phases in world history. From a rear-view mirror, the British Commonwealth revealed the fading and dissolving might of the erstwhile British Empire; while from the window upfront, the emerging political and environmental realities of a rapidly decolonizing world appeared visible.

The Commonwealth template, thus, is intended to enable us to sidestep the nation-state centred emphasis without entirely ignoring the latter as a distinct geographical and environmental fact. Environmental history writing as the contemporary challenge, in essence, for us, should attempt, what Richard Grove felicitously termed as the quest to achieve a 'global synthesis'. The term global synthesis, for Grove, was to capture in a single frame not only the many sided environmental impacts brought on by the 'European capitalist system over the globe' but also grasp the 'minutiae' of the resistance by indigenous societies to dramatic environmental change.[24] Putting the British Commonwealth under a single lens, thus, allows us two added significant conceptual gains. For one, allows us to make comparisons and explore differences in forestry and environmental policies that were played out globally.[25] Second, studying forestry and the environment within the Commonwealth gives us the added strength to view in connected ways a vast and diverse range of forest types and management histories. The geographical spread of the complexity and diversity of the forests under direct rule of Empire by the late 1920s is explained by Gregory Barton:

> By 1928 British Foresters managed environmentally every major forest type in the world. By 1936 the British Empire included a quarter of the land surface of the

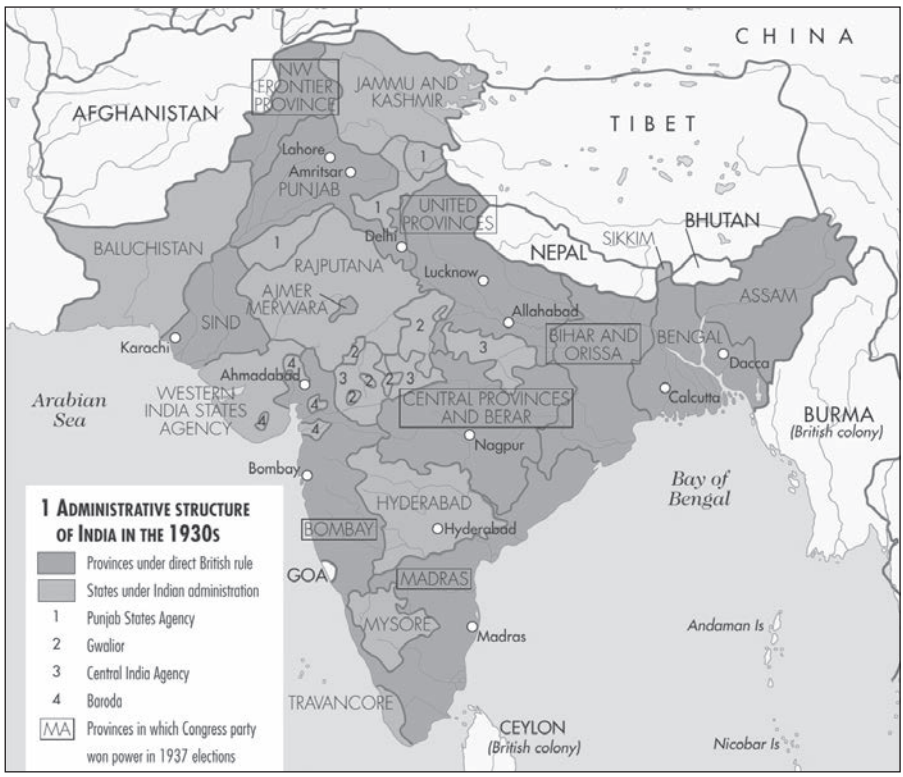
world, and of this, forests constituted one fourth. Fifty separate forest services protected not only trees but also soil, water, and — so foresters believed — the climate of entire continents and regions. Empire forestry triumphantly claimed credit for this achievement and served as an example for much of the reserved forest areas outside the British colonies. Out of the total empire of 9,737,660 square miles, Whitehall approved 2,465,530 miles as classified governmental forests, approximately 25 percent of British possessions and 8 percent of the land surface of the world…Forests in India, Australia, New Zealand, Canada and the far flung colonial empire in Africa, Latin America and the West Indies constituted a global environmental laboratory with innovative strategies and new management techniques, watched attentively throughout the world.[26]

The British Empire sought to manage, administer and harness this vast global resource by first assembling and then deploying a professional body of foresters. In fact, as is also pointed out, by 1928 close to fifty separate forest departments were established in different corners of the Empire, staffed by 1,500 officers who were in turn supported and assisted by 'tens of thousands' of 'native junior officers'.[27] Foresters for the Indian service were initially trained from 1864 to 1884 at the French National School of Forestry in Nancy, France, with a syllabus that was, in the words of Ravi Rajan, typically informed by the 'continental approach'. The training involved courses in 'silviculture, engineering, law, economics and management and the wider environmental aspects of forestry, including the fixation of dunes and the control of mountain streams'.[28] In 1885, however, the training of these foresters was moved to the Royal Indian Engineering College at Cooper's Hill in England.[29] The professionalization of forestry within the British Empire, however, signalled a high point with the instituting of the Empire Forestry Conferences in the early decades of the twentieth century. The first of these conferences was held in 1920 at Guildhall in London and was titled the British Empire Forestry Conference. The fifth was held in 1947 but was retitled the British Commonwealth Forestry Conference, and the final and sixth session was held in 1952 in Ottawa, Canada. According to Ravi Rajan, these forestry conferences, in several ways, were not only efforts by professional foresters to make a strong case for the 'scientific' management of forests but they also critically and energetically sought to raise their status as technical experts and further 'expand their control over forests and forest lands' across the world. [30] Moreover, through the conferences these foresters were also keen to assert themselves as a community of science professionals, whose technical abilities could address all local contexts.

Interestingly enough, it is precisely these self-perceptions about being defined as 'men of science' that makes the study of forest histories through comparative frameworks even more compelling and insightful. And two of the largest blocs comprising forest experiences within Commonwealth forestry would undoubtedly be that of South Asia and Africa. We briefly rehearse some of the major discussions through the forest and environmental history writings of these two major continents.

Forests in South Asian Environmental History

Given that the emergence of scientific forestry was coterminous with the expansion of the British Empire and the consolidation of European colonialism across the globe, South Asian environmental histories have intensely debated the links between forest conservation, environmental sciences and political economy. Richard Grove in his magisterial *Green*



MAP 3: British India in 1937.
Source: Philip's Atlas of World History, Concise Edition.

Imperialism argued that global intellectual networks on environmentalism and modern conservation were first assembled between 1600 and 1860.[31] The claim here was that early colonial encounters in the island environments of St. Helena, Mauritius and St. Vincent starkly brought home to the English, French and Dutch the debilitating social and economic consequences from dramatic ecological degradation. European anxieties grew in the new territories over potential scarcities, shortages and famines that could result from desiccation (deforestation leading to reduction in rainfall), loss of soil fertility, and the destruction of watersheds and river catchments. From the seventeenth century onwards, Grove suggests, a range of itinerant naturalists, botanists, colonial scientists and medical surgeons began to observe, collate, record and document environmental phenomena and draw links between ecological degradation, rapid denudation of forests, meteorological fluctuations, and extreme climate events such as droughts and floods. According to Grove, in time, these networks on environmental information steadily thickened and began to circulate and shape audiences at a global level. More pointedly, however, this new global environmental awareness ended up influencing and shaping state-led and centralized forest conservation strategies in British India and predated efforts for a state-sponsored forest policies.[32] Notably, one refer here to the formulation of the 'Dalhousie Memorandum of 1855', which was amongst the first considered strategies at the central level in British India for conserving forests.[33] The Dalhousie Memorandum, named after the then Governor-General, the Earl of Dalhousie (1848–56), was, in fact, the first systematically stated set of rules for restricting 'private interests' in forests and for declaring the latter not as wasteland but instead as 'state property'.

For Gregory Barton, in his *Empire Forestry*, the Dalhousie Memorandum also marked a defining moment for forestry in British India by becoming the basis for the enunciation of several subsequent forest Acts.[34] For Barton, however, 'Nature, imperialism, science and environmentalism are inextricably linked'.[35] The strong suggestion here is that scientific forestry in British India was born out of the political and economic exigencies of imperialism rather than from anxieties generated by the environmental sciences and the colonial science community.[36] Consequently, as Barton argues, the Dalhousie Memorandum was not the endpoint of the alarms raised by medical surgeons, naturalists, botanists and colonial scientists, but rather it marked the beginnings for the export from British India to the rest of world of the idea of Empire forestry—a model intended

to resolve the 'tension between romantic preservationist notions and *lassisez-faire* [economic] policies'.[37]

Ravi Rajan, in striking contrast, resituates the debate. In *Modernizing Nature*, he argues a compelling case for understanding modern forestry as emerging from an 'economic system'—a mix of cameralist[38] science and economics. As a type of cameralist science, the origins of modern forestry, for Rajan, could be traced to eighteenth-century Prussia, from whence it saw a steady transformation through German and French forestry practices and their technical inflections. At heart, the most radical change was brought about in the manner in which forests could now be accounted for quantitatively and then subjected principally to 'economic reason'. Rajan insightfully discusses how a series of profound transitions in the late eighteenth and early nineteenth centuries in Germany and France were being effected in the practice and conceptualization of the very notion of the forest itself. From being the erstwhile 'historic forest' of the local community, which was intended to meet the villagers' diverse agrarian needs, to becoming instead a 'contract with nature': defined as an economic resource, an infrastructure of the national economy and based on the control of forests as 'wood mass'.

Terming this radical shift in forest management as 'continental forestry', Rajan goes on to argue, in contrast to Grove, that foresters trained in continental forestry were in fact the key players who shaped and organized scientific forestry in the European colonies, and British India in particular. In effect, modern forest conservation and especially its state-driven and centralizing features emerged from European efforts to 'modernize' their forests rather than being a result of environmental alarms generated by colonial scientists working in the peripheral regions of the Empire. Rajan's *Modernizing Nature*, significantly as well, helps us understand not only how institutional science can be implicated in political and economic calculations but that continental forestry announced as much an ecological rupture in Europe as it did in the colonies by excluding local communities from access to their forests and using forestry to increase the productivity of timber through monocultures.[39]

A slew of regional studies on the politics and impact of scientific forestry in British India, however, has sought to underline the many twists and turns that shaped colonial forestry. Ramachandra Guha's *The Unquiet Woods*—the first self-conscious monograph on South Asian environmental history that was focused on incendiary peasant resistance

and ecological change in the Himalayan region. Central to the plot, in this now much celebrated book, was the fate of the oak, conifer and other broadleaved forests in the lower Himalayas (Uttarakhand), which were excessively felled by British colonial authorities from the mid-half of the nineteenth century onwards.[40] Subsequent efforts by the British authorities to conserve forests through 'scientific forestry', however, in Guha's opinion, were actually aimed at ensuring the government's insatiable demand for timber which was needed to make railway sleepers.

Guha rested his arguments on two claims. First, that there was a dramatic ecological rupture with the introduction of colonial forest management policies in the Himalayan region. Second, precolonial societies (small peasants) coexisted in relative harmony with their environment before the introduction of colonial rule. This rupture/equilibrium explanatory model was, in fact, further elaborated in a subsequent 1992 publication, which he co-authored with the ecologist Madhav Gadgil titled *This Fissured Land*. Here, the precolonial world in the Indian subcontinent was described as being marked by a 'considerable degree' of social coherence and ecological stability.[41]

Mahesh Rangarajan's *Fencing the Forest* was amongst the first to question the rupture/equilibrium model.[42] While Rangarajan pointed out that imperial forestry led to 'radical changes in the social and ecological fabric' within the Central Provinces, he found no precolonial community living in 'steady-state ecological harmony'. If anything, tensions between the inhabitants of the hill areas and the cultivators in the low lands were rife, much prior to the arrival of the British in the region.[43] Second, as Rangarajan has explained, colonial strategies and agendas for sequestering forests for imperial interests were not always realized as intended on the ground. In other words, the 'changes were not always in line with what officials hoped for. There were obstacles, at every turn, with the inhabitants of the region often having 'radically different priorities.'[44] In sum, the idea of ecological change from colonial forest policies must also be understood as something that was negotiated by the local populace in many unintended and unexpected ways.

The publication of K. Sivaramakrishnan's *Modern Forests* sharpened the discussion on the implication of colonial forestry policies in British India. *Modern Forests*, in examining the implementation of scientific forestry in the woodlands of Eastern India (Bengal), argued that 'its people, flora and fauna clearly emerged as agents able to confound foresters and resist their ambitious schemes'.[45] That is, the very stochastic

character of the woodlands ecology itself, alongside local social contexts, brought much grief to colonial management interventions. Thus, for K. Sivaramakrishnan, regional social and ecological dynamics better explain the emergence, implementation, success or failures of colonial forestry.

In 1998, Richard Grove, Vinita Damodaran and Satpal Sangwan brought out a voluminous collection of essays titled *Nature and the Orient*, which aimed to comprehensively capture the state of environmental history writing in South and South-east Asia.[46] Out of the thirty-one essays in the collection, about twenty were focused on forestry. This was a decision for which the editors were going to 'make no apology', because, as they averred in the introduction, not only were the vast sprawling forests of South and South-east Asia relatively ignored compared to the arable land, but regional variations on forestry needed many more micro-narratives and ground-level studies. Consequently, a range of themes were identified and discussed under the broad rubric of scientific forestry: (*a*) exclusion of local communities from access to forests; (*b*) the steady elimination of swidden or shifting cultivation; (*c*) colonial forest regulations and popular resistance; (*d*) the transformation of mixed forests into monocultures and plantations; (*e*) deforestation and famines; and (*f*) trade in forest products and minor forest produce.[47]

Nature and the Orient was followed by a number of monographs and peer reviewed articles on colonial forestry in South Asia that kept the emphasis on regional case studies. It nonetheless bears mentioning a few. Dhirendra Datt Dangwal's *Himalayan Degradation* revisited in finer detail the colonial forestry intervention in the Himalayas (Uttarakhand). While not necessarily upturning Guha's claims in *Unquiet Woods*, Dangwal, by deepening the archival engagement, ended up arguing that the impact of scientific forestry was far more staggered and uneven than previously argued. Commercial forestry, he points out, undoubtedly did defeat the stated objectives for conservation and the peasants consistently fought to preserve their traditional access and yet at times even sought to be part of the new economy of colonial forestry.[48] Deborah Sutton's *Other Landscapes* examines fresh terrain by discussing colonial forestry schemes in the Nilgiri hills of south India. These hills, we are informed, held no valuable hardwoods such as teak or Sal and yet became the site for an exceptional colonial forest conservation strategy. Sutton compellingly describes the dramatic environmental upheaval in the Nilgiri hills, which started with the enthusiastic planting by colonial authorities of the exotic Australian acacia (*acacia robusta*), from the mid- nineteenth century

onwards. The indigenous *shola*-grassland mosaic endemic to the hills, on the other hand, was systematically eliminated. In effect, by combining a British landscape aesthetic with a colonial sense of forest utility, the Niligiri landscape was radically reconstituted and in time led to the further marginalization of the indigenous Toda and Badaga populations.[49] Amongst the relatively under-researched forest environments of British India was the North-east region. Arup Jyoti Saikia's *Forests and Ecological History of Assam*, however, settles the issue by being the first environmental history monograph on the North-east region of India. Forests, unsurprisingly, figure prominently in the discussion. Whilst Saikia is keen to underline that the story of forests in colonial Assam was not radically different from the history of scientific forestry in the rest of British India, there were nonetheless sharp departures as well. Notably, in the fact that while the British were relentless in their quest for teak and Sal they were unable to entirely dominate and control the Assam forests. In part, scientific forestry and forest commercialization through plantations had to contend with the different histories of tea growing and wildlife management.[50]

African Environments, European Ideologies and Colonial Forestry[51]

The big themes in African environmental history continue to focus on forests and forestry, conflicts over conservation, migration, resource use, indigenous knowledge, soil erosion, degradation and famine. The inadequacy of conventional wisdom to describe the condition of the African landscape and the criticisms of dominant beliefs associated with African range management, pastoralism, wildlife, desertification, forestry and soil erosion has resulted in a thematic orientation, which for Richard Grove, has been substantially shaped by European attempts to study, explore and explain African environments, through the course of the nineteenth and early twentieth centuries.[52] The earliest European environmental accounts on Africa, Grove points out, like in Asia, were by colonial travellers and scientific personnel of empire. As European interest of the great continent of Africa grew through exploration, various western theories on the African environment were also put forward in a variety of studies, journal articles and popular booklets. This environmental mapping of Africa by Europeans drew from a range of their geographical, economic and political reasons.

In the mid half of the nineteenth century, David Livingstone's explorations heralded a new phase in the European understanding of the African environment (See Map 4). Heralded as the 'greatest of all African travellers,' (for the European and Western world), he sailed to South Africa as a medical missionary in 1840 and by 1849 had crossed parts of the Kalahari desert and reached Lake *Ngami*, which had never before been visited by a European. Though fever and mosquitoes and the death of their animals through the tsetse fly forced Livingstone's entourage to return, he nonetheless was able to conclude that the lake shoreline features in the Kalahari indicated great rainfall episodes in the past and was followed subsequently by periods of intense desiccation brought about by human activities.[53] In Southern Africa, John Croumbie Brown was similarly inclined to think that human agency may have been involved in the deteriorating environmental conditions in the region.[54]

MAP 4: A historical Map of the Forest Plateau of Africa.
Includes rivers, lakes, cities, and the route of the explorer Dr Livingstone
in his explorations between the years 1851 and 1873.
http://www.gutenberg.org/files/17024/17024-h/17024-h.htm.

The discovery towards the end of the nineteenth century of moraines on Mt Kenya and Kilimanjaro, far below the tongues of present glaciers, made it plain to other explorers as well that the climate of Africa had probably been much cooler in the past. In West Africa, J.D. Falconer described in *The Geography and Geology of Northern Nigeria* (1911) that formerly extensive fields of linear dunes had now been covered in vegetation and supported a large population, stretching well into northern Nigeria, far to the south of the current limits of the Sahara.[55] About the same time Tilho (1911) brought back evidence of a great lake that might have existed in the Bodele depression, between Tibesti and Lake Chad.[56] In other words, the Sahara had evidently been much more extensive at some times in the past and at other times much less arid.

The years immediately prior to 1900 also saw a renewed European interest in developing what were essentially millennial theories about global desiccation, closely related to contemporary convictions about the 'inevitable' extinctions of both indigenous people and large tropical mammals such as the African Elephant. These theories were reinforced by climatic events. By the end of the nineteenth century it was evident that short-term vicissitudes of the African climate were of considerable economic importance. In East Africa, the level of Lake Victoria rose suddenly in 1878 after unusually heavy rains. A few months later there were abundant rain over the Blue Nile's catchment in Ethiopia and disastrous floods followed in Egypt. In Southern Africa in 1862 and between 1881 and 1885 there were severe droughts. Alexander Knox in *The Climate of the Continent of Africa* (1911), pointed to what he saw as a decline in the rainfall of nineteenth century Senegal.[57] Over the next decade, rainfall was greater in Senegal and the rest of the Sudano-Sahelian but in 1913 there came a drought disaster, the terrible results of famine in Northern Nigeria that year being graphically described by Hastings in his *Nigerian days*.[58] In Egypt in the same year the flow of the Nile was phenomenally low, and in Southern Africa as well there was widespread drought.[59]

Similarly, some of the political and existential anxieties produced immediately prior to the First World War emerged in such doom–laden books as William Macdonald's widely read *Conquest of the Desert* which had appeared in 1913.[60] After the war a generalised revulsion at the enormity of the war mortality was reflected in a strengthened awareness of the potential for future human destructiveness on a world scale. This prompted major retrospective views on comparable past narratives of

mass human disruptions of life and environment and perhaps helps to account for the flurry of colonial publications and commissions on the connections between drought and human activity that appeared in the early 1920s. In 1920, it was the turn of the French to voice their desiccation fears, above all in an influential article by H. Hubert on '*le dessechement progressive en Afrique Occidentale*'.[61] However it was in semi-arid South Africa that the gospel of desiccation found its most pronounced and didactic post-war expression. Here, in 1919, E.H. L. Schwartz published on 'The Progressive Desiccation of Africa; The Cause and the Remedy'.[62] Even the wording of the title echoed that of J. Spotswood Wilson's seminal article of 1865 on 'The Progressive Desiccation of Inner Southern Africa', which had been based on an address to the Royal Geographical Society in that year. Schwartz followed his article with a book published in 1923 on *The Kalahari; or Thirst land Redemption*, a title which gives us a clue to an underlying crusading element of the desiccation discourse.[63] Schwartz's message was directly transmuted into government policies through the 1922 report of the South African Drought Commission, a highly alarmist document.[64] This alarmism revealed, for the first time, the beginnings of a North American influence in British colonial soil and forest conservation, at least in South Africa. Two of the Afrikaner members of the Commission had worked in the United States as refugees after the South African War (1899-1902). H.S.D. Du Toit, its chairman, trained in the United States as an agronomist and later became the head of South Africa's agricultural extension service. R.J. Van Reenen studied civil engineering and worked on irrigation projects in Nebraska before returning to the Transvaal Civil Service. T.D. Hall, one of the first South Africans to write systematic historical studies of pastures, studied agriculture in Illinois in 1910-13.

In the 1920s the Colonial Office was the main employer of British biologists, geologists and geographers. This was especially the case in the Anglo-Egyptian Sudan, about which some of the first literature on desert-spreading or desertification now began to be written. A pioneer in this area was E.W. Bovill, who echoed Schwartz in South Africa in his 1921 paper on 'The encroachment of the Sahara on the Sudan'. His arguments were further followed up in an article entitled 'Sahara' in 1929.[65] Bovill's articles were in turn taken much further by G.T. Renner in one of the first articles to paint Africa as a potentially famine-ridden continent, under the title 'A famine zone in Africa; the Sudan', published in 1926.[66] A widespread semi-arid region meant that a disproportionately

large alarmist South African literature developed on environmental matters. In the early 1950s, these fears would be given cogent form in John Acocks' extremely influential maps of spreading desertification.[67]

The emergence of a period of environmental alarmism in North America, consequent on the prolonged 'dustbowl' droughts in the Southern United States in the early 1930s, supplemented the existing colonial panic about the deserts spreading.[68] This increased local anxieties affected policy in some British and French colonies. Thus the New Deal conservationism of the United States was emulated particularly in the east and central African colonies. Soil erosion had already become a prominent issue in India during the period 1890-1925 and huge investments to control it were made, for example, in the Etawah region of the United Provinces of Northern India. These efforts, like similar measures in West and South Africa, long predated the American 'Dustbowl' alarmism. In 1934, E.P. Stebbing, the prominent Indian forester, and one-time Professor of Forestry at Edinburgh University, visited West Africa. Stebbing, as we noted earlier, was the earliest historian of Indian forests and by the time of his visit had already published a three volume work on *The Forests of India*, much of which detailed the history of environmental concern and early conservationism among the first surgeon-foresters of the East India Company medical service.[69] His short visit to the French and British West African colonies, made, significantly, during the dry season, provoked him into writing a feverish warning on what he saw as the dangers of desert-spreading. The title of this essay; 'The Encroaching Sahara; the threat to the West African colonies' indicates that he had almost certainly read Bovill's similarly titled 1921 article on 'The Encroachment of the Sahara'.[70]

While Stebbing's somewhat hysterical warnings were downplayed by local colonial scientists, who had much greater experience of the causes, rates and seasonality of local desertification and erosion, his terminology was taken up with alacrity by governing circles in Paris and London.[71] Stebbing's writings led directly to the founding of the Anglo-French Boundary Forest Commission. This Commission, started in 1934, soon found that Stebbing's warnings were largely unjustified, and his analysis was decisively dismissed by B. Jones, a member of the Commission, in an article published, as Stebbing's had been, in *The Geographical Journal*.[72] Notwithstanding, in 1937 Stebbing, now Professor of Forestry in Edinburgh, pursued his concerns in *Forestry in West Africa and the Sahara; a Study of Modern Conditions* and in an inflammatory work called, *The*

Creeping Desert in the Sudan and Elsewhere in Africa.[73] He was not alone. In 1938 Francis Ratcliffe, fresh from his investigations of the causes of soil erosion in South Australia and Queensland, published *Flying Fox and Drifting Sand*, a savage indictment of the impact of extensive outback agriculture, and the first of a long line of apocalyptic books on the degradation of the Australian environment, many of which exercised a disproportionate influence on global environmental concerns far outside the antipodean context.[74] Ratcliffe was familiar with the writings of Keith Hancock, later a prominent historian of the British Empire and Commonwealth, who in 1931 had published a virulent attack on profligate deforestation and land-clearing by settlers.[75] Hancock, a Quaker, was the biographer of Jan Smuts and was undoubtedly influenced by the 'holistic' views of the latter, not least in his role as an early environmental campaigner and environmental historian. Both men, Hancock and Smuts were, in fact, profoundly interested in the historical impact of white colonial settlement on indigenous peoples and their environments at an imperial and world scale.[76]

Much of the European and colonial desiccationist and alarmist narratives that Richard Grove skilfully outlines and describes, have come in for sustained critique in a fresh wave of environmental histories on Africa and forestry in particular. In what is now widely acknowledged to be a path-breaking study, James Fairhead and Melissa Leach convincingly critiqued the then widespread belief of policy makers and development officials that Guinea's (Western Africa) forest margins were severely degraded by a combination of commercialization, institutional breakdown, growing populations and migration into the region. It was, furthermore, held that the local inhabitants had steadily converted their humid forests into dry savannah grasslands through shifting cultivation and fire practices. In contrast, Fairhead and Leach were able to establish the opposite: that Guinea's forest margins were actually characteristic savannah grasslands that had been over time peppered with community planted forest islands, who also encouraged the growth of secondary forest thickets.[77] James McCann in his elegantly written sweep of African environmental history in *Green Land, Brown Land, Black Land* points to how a similarly misplaced narrative sustained a belief that the Ethiopian high plateaux was severely deforested by a growing population and intensive cultivation. McCann, however, shows with historical evidence that the highland region instead was not heavily forested in the first place and was pretty much as nineteenth descriptions revealed it to be—a zone

that was always typically marked by a 'few primary forests in inaccessible zones and agricultural fields'.[78]

Kate Showers has persuasively challenged the colonial story of soil erosion and collapse. She argues that the massive gully erosion that dominated the 1970s Lesotho lowland landscape, was not triggered by local land use practices as put forward in the colonial record, but rather by the collection and concentration of water caused by colonial interventions in the landscape. Clearly, the careful review of records and the incorporation of local perspectives in environmental processes has helped question and upset a slew of entrenched and commonly held views about African environments and the relations of local communities.[79] Similarly, recent writing on colonial Somaliland has argued that the division of Somaliland into various colonial spheres actually reduced the land available for use by pastoralists, leading to overgrazing, soil erosion and ecological degradation.[80]

While colonial states in Africa carried out the ruthless appropriation and intense exploitation of natural resources, some also began to veer around the need for environmental regulation: including forest protection, game preservation, and soil and water conservation. As Grove and Anderson note, it was forest conservation rather than wildlife that first dominated environmental regulations in Africa.[81] Unsurprisingly, in most if not all the early colonial accounts, the blame for environmental degradation was usually pinned on the native African for their supposedly excessive exploitation of soils and the general destruction of forests. In Kenya, David Anderson has noted that colonial anxieties about the presumed destructive environmental consequences of traditional African agriculture, in fact, helped the colonizers to justify the further seizure of African lands.[82] It would be wrong, on the other hand, to entirely argue that local African populations lived in complete harmony with their environments. Environmental historians, such as Robert Harms, have noted in the context of equatorial Africa, for example, how the *Nunu* of the Congo basin exhausted their lands and their fish sources.[83] On the other hand, colonial and European representations of African landscapes as being wild, romantic and untouched by human impact, nonetheless, could also include a vision of an empty landscape with a responsibility both for its celebration and protection. Grove has persuasively argued for a European environmental sensibility located in an Edenic discours in which wild-life protection and aesthetic reasons for conservation drove colonial efforts to alienate local populations from access to

natural resources (See Figure 1).[84] Significantly, the Edenic vision of the landscape also allowed an African presence through the myth of the 'noble savage'. To protect the ostensible idea of the primitive, the African 'savage' was to preserve something of Europe's own origins as a remnant of the natural state of humanity. In Tanzania, draconian forest reservation policies were adopted by the German colonials who sought to reconstitute elements of African nature to create a German *Heimat*—evolved around the idea of a rural landscape and the forest that shaped the German's people's sense of folklore, culture and identity.[85]

Conserving 'African nature' as protected areas by alienating locals from their traditional access, became a standard conservation strategy. Roderick Neumann in his compelling *Imposing Wilderness* describes how the local Meeru population of subsistence cultivators and herders in Tanzania were steadily and systematically denied their previous access to the slopes of Mount Meeru as it was turned into the Arusha National Park. Getting Mount Meeru, in fact, to thus fit the ideal of a picturesque Africa, Neumann points out, drew substantially upon American ideals

FIGURE 1: Illustration showing traditional hunting practices in Central Africa, from Livingstone's Diaries.
Source: Livingstone's Africa: perilous adventures and extensive discoveries in the interior of Africa: from the personal narrative of David Livingstone … together with the remarkable success and important results of the Herald-Stanley expedition, Biodiversity Heritage Library. https://www.biodiversitylibrary.org/item/212119#page/36/mode/1up.

about nature preservation following the creation of the Yellowstone National Park.[86] Implementing the Yellowstone model for all of the world's national parks required the prohibition of any form of human settlement and subsistence activities within the park. However, much of the discussion of the African landscape was also focused on the European identity myth. For South Africa, Jane Carruthers path-breaking monograph on the Kruger National Park showed how the park's creation in 1926 came at a critical political juncture as it became an important unifying symbol of white identity.[87] Naming the park after Paul Kruger, thus, was a calculated decision to enlist the support of Afrikaners and create a symbol of cultural unity. Similarly, in Zimbabwe, the creation of the Matopos Park in 1926 began decades of political struggle. The fulcrum of the struggle was the different ideas of heritage and how best to preserve it. At the height of the guerrilla movement in the 1970s, the national park became the focus of the political battle between two competing myths, one white and one black.[88] In Serengeti National Park in East Africa, the British were attempting to implement mythical African wilderness and the creation of the park coincided with the Queen's coronation celebration. As indigenous Africans were left out of the reckoning, this policy had important reverberations for groups like the Maasai. As Carruthers notes of the case of Pongola Reserve in South Africa, reserves were also created to keep other colonial competitors out. It was the native Africans, however, who were often targeted by the European colonizers as being the most destructive force on the environment. In South Africa, British colonial officials had been evicting Africans from Crown forests since the late nineteenth century, and from the 1940s Africans were moved out of a string of newly proclaimed nature reserves. So-called betterment planning crowded Africans into 'native reserves' (later Bantustans) and within these tried to regulate land use through fencing, villagization, removal of 'excess' livestock, and similar draconian measures. Post-apartheid, a bloc of Southern African states continue to advocate intrusive forms of land management as part of the conservation ethic.[89] As nationalism and conservation became intertwined, the 'the idea of the wilderness found fresh adherents'. President Julius Nyrere was to say that Tanzania's natural resources were held in 'trusteeship for the whole world'.[90] The eviction of the Maasai from Serengeti was paralleled by the continued eviction of several types of subsistence and pastoral groupings in postcolonial Tanzania by governments that saw 'displacement as a prerequisite to conservation'.

However, there has been progress in participatory conservation and the preservationist model is not the only approach to protection. In Kenya, for example, between 1997 and 2002, over 2,500 sq. km. of land was set aside for conservation by communities and landholders.[91] In Zimbabwe, the CAMPFIRE Project has been widely hailed as a community conservation success story, though as Alexander and McGregor have noted there have been considerable local variations in the success of its implementation.[92]

The Current Collection

The first thematic arrangement titled 'colonial resources and the making of the global' is made up of essays by David Hsiung, Jan K. Oosthoek and Richard Grove, who help outline for us the intricate and complex global intellectual and resource entanglements of the British empire's colonial project. Hsiung, in a detailed study traces how the royal British Navy during the 'Age of Sail' (the eighteenth and early nineteenth centuries) depended on a vast ecological spectrum of temperate forests—stretching from the Baltics to Canada—to meet their growing demands for ship masts. In other words, the British navy assembled and sustained an unprecedented global market for timber extraction in order to source out its huge appetite for wood. Along a different axis of concerns but nonetheless global in scale were the crafting of ideas for the scientific management of forests. Oosthoek's systematically traces the diverse intellectual traditions that were blended and fused to shape the colonial forest conservation strategy in British India. For Oosthoek, German and French models of scientific forestry were modified on the ground by the Scottish experience with decentralized estate forestry for conserving and controlling Indian forest environments. In a similar vein over what global intellectual networks and linkages meant to the shaping of the British Empire's environmental policies in their colonial possessions, Richard Grove, in his essay, suggests that British alarms about climate change, desiccation and environmental degradation were often generated by their various experiences with differing environmental contexts across the globe. In sum, this theme sets up the global context which informs many of the British Empire's environmental projects that were implemented in diverse localities and in different ecological locations.

The second theme with essays from Jayeeta Sharma, Deborah Sutton, James Webb and Ajit Menon under the title 'South Asian forests in the

commodity and revenue frontier', discusses one of the most critical dimensions of the British colonial environmental impacts in South Asia: notably, how radical environmental change was brought about in the forested tracts. Sharma's essay explores how the evergreen tropical forests of Assam (Eastern India) was drastically transformed with the introduction of tea plantations in the region in the nineteenth century. In essence, the success of these radical environmental changes through the creation of the tea plantation economy, Sharma points out, depended greatly on the colonial government's ability to insert the region into global commodity markets. Sutton, on the other hand, discusses how the introduction of exotic species such as the Australian blue gum (*Eucalyptus globuli*) and the *Acacia robusta* in the Nilgiris (South India) led to the steady 'reconfiguration' or elimination of the indigenous *shola* dominated forest landscapes in the region. Webb too paints us a similar picture of steady and deep seated ecological change in the once verdant rainforests of the Kingdom of Kandy in Ceylon (today's Sri Lanka). By 1900, Webb explains in his essay, plantations of tea had all but overwhelmed and pierced the previous 'green shield' of exotic forests and vegetation that was part of the older tradition of slash and burn agriculture. We round up this section with Ajit Menon's reflections about the need to grasp how forest and fields were intimately linked landscapes in the Kolli Hills (South India) in the pre-colonial period. With the introduction of colonial rule, however, these intricate connections between the forest and the field were violently sundered by colonial revenue policies

The third theme titled 'Colonial forestry and "(mis)understanding" African landscapes' comprises essays by Motlatsi Thabane, Michael Tuck, Uyilawa Usanlele, Thaddeus Sunseri and Andrew Wardell. These essays offer detailed critiques of the efforts of how the British authorities in their colonial possessions in Africa sought to control and create what they presumed to be more productive and 'improved' forests. Thabane's essay describes for us the colonial government's enthusiastic attempts to implement tree planting campaigns in Lesotho. And much to their grief, the colonial authorities discovered after many tribulations and trials that Lesotho was actually part of the great South African grasslands rather than being a denuded landscape. Tuck's essay discusses the struggles over the control of the forests through the course of the 1900s between the British and the Bawanda people of colonial Uganda. The British, as Tuck points out, were keen to delink the forests from the cultivation strategies of the Bawanda communities with the presumption that the

forests could be transformed into distinct economic resources. Usanlele examines British colonial forestry management practices in the Benin rainforest of Nigeria by exploring the complex of colonial ideologies that underpinned a mix of logging and conservation practices. In a study of forest management practices in Liwale—located in British-controlled Tanganyika Territory—Sunseri argues that colonial forest conservation strategies were actually intended to concentrate local populations into 'closer settlements' in order to then tap their labour, direct their agricultural activities, and tax them. Wardell's essay helps reminds us how enduring colonial forestry legacies were in Africa, even decades after countries achieved their independence. He points out that while the Forestry Department in independent Ghana maintained its distinctive identity as part of a nationally integrated bureaucratic hierarchy it still drew upon a raft of colonial legacies for pursuing centralization, exclusion, and restrictive legislations that ignored people's property and use rights.

The fourth theme broadly titled as 'Pre-colonial African worlds and Colonial environments' begins with Olutayo Adesina essay, which provides an insightful discussion on how forest conservation cultures and practices in pre-colonial West African societies enabled local communities to harness forests as ecosystems that provided a range of livelihood materials and products. These traditional controls and relationships in the Yoruba region of South Western Nigeria, however, were radically sundered and transformed with the coming of British colonial rule. Vimbai Kwashirai essay elaborates in considerable detail what he terms as the traditional thinking for the 'consumption and conservation' of forests or *gusu* in Matabeleland, Zimbabwe. The traditional methods allowed for the multiple uses of the forest, alongside a deep religious understanding of the taboos and prohibitions in the management of natural resources. Brian Morris's essay completes this section by providing us with a granular discussion on pre-colonial Africa. He explores in considerable detail the political economy of Northern Zambesia in the nineteenth century and the relationship between ivory trade involving the hunting of elephants and the rise of chiefdoms and petty states. This essay provides a rich insight into pre-colonial African state making before the advent of the British.

The fifth theme titled as 'Caribbean and New Zealand forest histories' helps further the environmental history of empire by looking at forest histories of the Caribbean and New Zealand. The aim is to provide

comparisons across different locations within the empire. In New Zealand as Paul Star and James Beattie show, forestry ideas moved between New Zealand, other colonies and the countries both within and beyond the British Empire. There was also a strong South Asian influence on forestry policies and the climatic effects of deforestation received a great deal of attention in New Zealand. As the writers note, it is thus only in a global context that the history of New Zealand's forestry policy can be understood. In the Caribbean, where one of the earliest forest reserves were found on the island of St Vincent, British forest policy as Rita Pemberton notes was inconsistent. As the plantation economy took over there was limited concern about forests or the environment until the 1880s when the emergence of colonial tropical forestry facilitated the emergence of imperial forestry which was centred around Kew gardens. Whilst the inconsistencies of colonial forest policy are also clearly indicated in this paper it is the global context of the debates that is once again evident here.

The last theme titled as 'Soil, Disease and Environmental History' helps us understand how colonial interventions in the natural world went much beyond only instituting forest policies. Kate Shower's essay traces and establishes how the global circulation of ideas and anxieties about soil erosion—between the United States and South Africa, in particular—helped shape soil protection strategies in colonial South Africa. Shane Doyle's essay on the Tsetse disease insightfully suggest that many European cultural assumptions about sanitation and racist framing about the 'uncivilized African' underwrote public health policies for colonial Uganda. Many of Africa's modern national parks and forest reserves, moreover, as Doyle also points out, in fact, owed their origins to depopulation programmes carried out in the name of public health.

As the essays in this volume suggests, the history of colonial environmental ideas reveals the interplay between global climatic ideas of desiccation and the practical effects of implementing a forest policy in the face of opposition by local communities, either indigenous groups in India, Africa or plantation owners in the Caribbean or elsewhere. Ideas on colonial environmental policy were swapped between different colonial empire through a shared network of scientific exchange and information. Despite false starts and hiccups, state forestry in the British imperial context took the shape and form of a stringent land management system in South Asia, Africa and the Carribbean where land, peoples and wildlife were carefully managed in a context of an imagined jungle

or wilderness. The debates and rich detail of our case studies we hope makes for fascinating comparisons.

NOTES

1. A very short list (and by no means comprehensive) of recent works which highlight the challenges that climate change research poses for social sciences and humanities would be: Anthony Giddens, *The Politics of Climate Change*, Cambridge: Polity Press, 2009; Mike Hulme, *Why We Disagree About Climate Change*, Cambridge and New York: Cambridge University Press, 2009. Also see a detailed review of books on climate change by C. Gregory Knight, 'Climate Change: The Health of a Planet in Peril', *Annals of the Association of American Geographers*, vol. 100, no. 4, 2010, pp. 1036–45. Three recent collections that curate and introduce essays and writings on climate change are Bill Mckibben, ed., *The Global Warming Reader: A Century of Writing about Climate Change*, New York: Penguin, 2011; Jessica Barnes and Michael Dove, eds., *Climate Cultures: Anthropological Perspectives on Climate Change*, New Haven and London: Yale University Press, 2015; and Libby Robin, Sverker Sörlin and Paul Warde, eds., *The Future of Nature*, New Haven and London: Yale University Press, 2013. An excellent collection on India would be Navroz K. Dubash, ed., *Handbook of Climate Change and India: Development, Politics and Governance*, New Delhi: Oxford University Press, 2012. Also see, Praful Bidwai, *The Politics of Climate Change and the Global Crisis: Mortgaging our Future*, Hyderabad: Orient BlackSwan, 2012.
2. See the seminal essay by Dipesh Chakrabarty, 'The Climate of History: Four Theses', *Critical Inquiry*, vol. 35, no. 2, 2009, pp. 197–222. Also see Julia Adeney Thomas, 'History and Biology in the Anthropocene: Problems of Scale, Problems of Value', *American Historical Review*, vol. 119, no. 5, 2014, pp. 1587–1607.
3. See, in particular, 'Climate Change 2014: Synthesis Report', Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Core Writing Team, ed. R.K. Pachauri and L.A. Meyer, IPCC, Geneva, Switzerland, 2014, pp. 51–3. See http://www.ipcc.ch/pdf/assessmentreport/ar5/syr/AR5_SYR_FINAL_All_Topics.pdf, accessed 3 September 2016.
4. Neil Roberts, *The Holocene: An Environmental History*, Oxford, UK; New York: Blackwell, 1989; 2nd edn, Oxford: Wiley-Blackwell, 1998.
5. Will Steffen et al., 'The Anthropocene: Conceptual and Historical Perspectives', *Philosophical Transactions of the Royal Society*, vol. 369, no. 1938, 2011, p. 843, pp. 842–7. The idea of man as a 'geological agent', however, has been a claim made by several earlier environmental thinkers. In fact, Ravi Rajan notes that the likes of G.P. Marsh, E. Reclus and John Croumbie Brown likened adverse human impacts upon the natural world in the course of the nineteenth century to that approximating geological scales. See Ravi Rajan, *Modernizing Nature:*

Forestry and Imperial Eco-Development 1800–1950, New York and New Delhi: Oxford University Press, 2006; repr. Hyderabad: Orient Longman, 2008, p. 22.

6. See, for example, Gaia Vince, *Adventures in the Anthropocene: A Journey to the Heart of the Planet we Made*, London: Chatus and Windus, 2014; Amitav Ghosh, *The Great Derangement: Climate Change and the Unthinkable*, Chicago: University of Chicago Press, 2016. Several projects and programmes devoted to researching the Anthropocene have in fact already been initiated. Notably, 'The Anthropocene Project' by the The Haus der Kulturen der Welt (HKW), see, http://hkw.de/en/programm/projekte/2014/anthropozaenprojekt_ein_bericht/anthropocene_working_group_1/awg_biografien.and the Anthropocene study programme at the University of Chicago.
7. See John W. Williams and Stephen T. Jackson, 'Novel Climates, No-analog Communities, and Ecological Surprises', *Frontiers in Ecology and the Environment*, vol. 5, no. 9, 2007, pp. 475–82. Also see, Richard J. Hobbs, Eric S. Higgs and Carol M. Hall, eds., *Novel Ecosystems: Intervening in the New Ecological World Order*, Oxford: Wiley-Blackwell, 2013.
8. Johan Rockstrom et al., 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity', *Nature*, vol. 461, no. 7263, 2009, pp. 472–5.
9. On the issue of knowledge, power and scale, see Sheila Jasanoff, 'A New Climate for Society', *Theory, Culture & Society*, vol. 27, nos. 2–3, 2010, pp. 233–53. Also see, Sheila Jasanoff and Marybeth Long Martello, eds., *Earthly Politics: Local and Global in Environmental Governance*, Cambridge, Mass.: Massachusetts Institute Technology Press, 2004.
10. We borrow this term from a recent edited volume that looks at the troubled politics and ecological consequences that follow from efforts that seek to conserve flora and fauna within the hard legal boundaries of parks and sanctuaries in India. See Mahesh Rangarajan, M.D. Madhusudan and Ghazala Shahbuddin, eds., *Nature without Borders*, Hyderabad: Orient BlackSwan, 2014. Also see Mahesh Rangarajan and K. Sivaramakrishnan, *Shifting Grounds: People, Animals and Mobility in India's Environmental History*, New Delhi: Oxford University Press, 2014. There have been equally intense discussions over whether a strong nature-culture divide holds in South Asian environmental history. Among the first edited volumes to debate the divide for South Asia, see Arun Agrawal and K. Sivaramakrishnan, *Social Nature: Resources, Representations, and Rule in India*, New Delhi: Oxford University Press, 2001.
11. Donald Worster, 'What is Global Environmental History?', Conversation with Piero Bevilacqua, Guillermo Castro, Ranjan Chakrabarti, Kobus du Pisani, John R. McNeill, and Donald Worster, ed. Gabriella. Corona, 2003, p. 233. www.whpress.co.uk/GE/Articles/FORUM.pdf, accessed 22 October 2017.
12. John R. Mcneill, 'What is Global Environmental History?', Conversation with Piero Bevilacqua, Guillermo Castro, Ranjan Chakrabarti, Kobus du Pisani, John R. McNeill, and Donald Worster, ed. Gabriella Corona, 2003, p. 236. www.whpress.co.uk/GE/Articles/FORUM.pdf, accessed 22 October 2017.
13. Here one can cite a number of monographs which have pushed the envelope on the need for the global scale in discussing environmental change. See, for

example, Edmund Burke III and Kenneth Pomerantz, eds., *The Environment and World History*, Berkeley, Los Angeles and London: University of California Press, 2009; Sing C. Chew, *World Ecological Degradation: Accumulation, Urbanization and Deforestation, 3000 BC–AD 2000*, Walnut Creek, California: AltaMira Press, 2001; J. Donald Hughes, *An Environmental History of the World: Humankind's Changing Role in the Community of Life*, London and New York: Routledge, 2001; J.R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-century World*, New York: W.W. Norton & Company, 2000; Clive Ponting, *A Green History of the World: The Environment and Collapse of Great Civilizations*, New York: Penguin, 1993; Joachim Radkau, *Nature and Power: A Global History of the Environment*, New York: Cambridge University Press, 2008; John F. Richard, *The Unending Frontier: An Environmental History of the Early Modern World*, Berkeley: University of California Press, 2003; and, of course, one must acknowledge the pioneering efforts of Alfred W. Crosby, see Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492*, Westport Connecticut and London: Greenwood, 1972; Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900*, Cambridge and London: Cambridge University Press, 1986.

14. Richard P. Tucker, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World*, Berkeley, Los Angeles and London: University of California Press, 2000.
15. William Beinart and Lotte Hughes, *Environment and Empire*, Oxford: Oxford University Press, 2007.
16. Deepak Kumar, Vinita Damodaran and Rohan D'Souza, eds., *The British Empire and the Natural World: Environmental Encounters in South Asia*, New Delhi: Oxford University Press, 2011. Also see James Beattie, 'Recent Themes in the Environmental History of the British Empire', *History Compass*, vol. 10, no. 2, 2012, pp. 129–39.
17. The article in *Nature* was in fact the briefest summing up of his more elaborate and detailed outline in *The Forests of India*, vol. I, see, E.P. Stebbing, 'The First Beginnings of Forest Conservancy in India, 1850–1857', pt. 3 in *The Forests of India*, vol. I, Edinburgh: William Brendon & Son, 1922, pp. 205–534.
18. E.P. Stebbing, 'A Century of Forestry: Forestry in the British Commonwealth in the Last Century', *Nature*, vol. 169, no. 4292, 1952, p. 173.
19. Ibid., pp. 173–7.
20. The Statute of Westminster, of 11 December 1931, was a British law that granted some of the former colonies full legal freedom except in those areas where they chose to remain subordinate to Britain. See 'Statute of Westminster' 22 George V, c. 4 (U.K.), http://www.legislation.gov.uk/ukpga/1931/4/pdfs/ukpga_19310004_en.pdf, accessed 22 October 2017.
21. S.R. Ashton, 'British Government Perspectives on the Commonwealth, 1964–71: An Asset or a Liability?', *The Journal of Imperial and Commonwealth History*, vol. 35, no. 1, 2007, pp. 73–94.
22. See, https://en.wikipedia.org/wiki/Commonwealth_of_Nations, accessed 10 September 2016.

23. By the 1920s, the British Empire was already attempting to recalibrate its relationships in the colonies. Some indication of this change in colonial character and emphasis is visible in the discussions and debates leading to the introduction of the Colonial Development Act of 1929 and the more comprehensive Colonial Development and Welfare Act of 1940. See Stephen Constantine, *The Making of British Colonial Development Policy 1914–1940*, London: Frank Cass, 1984. Also see, Joseph Morgan Hodge, *Triumph of the Expert: Agrarian Doctrines of Development and the Legacies of British Colonialism*, Athens: Ohio University Press, 2007.
24. See Richard H. Grove, *Ecology, Climate and Empire: The Indian Legacy in Global Environmental History (1400–1940)*, Delhi, Calcutta, Chennai, Mumbai: Oxford University Press, 1998, pp. 179–223.
25. For an attempt to explore connections and comparisons with regard to environmental change and ecological ideas across Empire, see R. Grove and V. Damodaran, 'Imperialism, Intellectual Networks and Environmental Change, Origins and Evolution of Environmental History,1676–2000: Part I', *Economic and Political Weekly*, vol. 41, no. 41, 14–20 October 2006, pp. 4345–54 and R. Grove and V. Damodaran, 'Imperialism, Intellectual Networks and Environmental Change, Origins and Evolution of Environmental History,1676–2000: Part II', *Economic and Political Weekly*, vol. 41, no. 42, 21–27 October 2006, pp. 4497–4505.
26. Gregory Allen Barton, *Empire Forestry and the Origins of Environmentalism*, Cambridge: Cambridge University Press, 2002, pp. 1–2.
27. Ibid., p. 3.
28. Rajan, *Modernizing Nature*, p. 81.
29. Ibid., p. 82.
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33. Ibid., p. 461.
34. Barton, *Empire Forestry*.
35. Ibid., p. 19.
36. Ibid., pp. 35–7.
37. Ibid., p. 1.
38. 'Cameralism was an early public policy doctrine that sought to reconstruct the economic foundations of a region [central Europe] devastated by a series of wars by providing state support to industries and banks, extending and

improving infrastructure (canals, bridges, harbours and roads), promoting modernization, and strictly regulating trade, commerce and the agricultural sector . . . cameralism emphasized the idea that the state ought to be a regulator of development and thereby serve the general happiness of the subjects.' See Rajan, *Modernizing Nature*, p. 35.

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51. This section draws mostly from Richard Grove's personal notes and published observations on African environmental history. The authors have essentially sought to retain his insights and larger claims, even though the field of environmental history writings on Africa, we acknowledge, has moved

considerably in recent years with new monographs and a vast number of journal articles and peer reviewed papers.

52. Richard Grove and Vinita Damodaran, 'Imperialism, Intellectual Networks, and Environmental Change: Origins and Evolution of Global Environmental History, 1676-2000': Part I and II, *Economic and Political Weekly*, vol. 41, no. 41 and 42, 14–21 October 2006, pp. 4345–54 and 4497–4505. Also see Melissa Leach and Robin Mearns, eds., *The Lie of the Land: Challenging Received Wisdom about the African Environment*, London: James Currey and Indiana University Press, 1996 and S. Dubow, ed., *Science and Society in Southern Africa*, Manchester: Manchester University Press, 2000. The latter volume shows how the discourse of science assisted in bolstering aspects of colonial power and exploitation and offered a means of legitimating colonial authority by counter posing Western rationality to native superstition. See particularly, the article by D. Posel in the volume, 'A mania for measurement, statistics and statecraft in the transition to apartheid', p. 116; see also William Beinart, Karen Brown and Dan Gilfoyle, 'Experts and Expertise in Africa Revisited', *African Affairs*, vol. 108, 2009, pp. 413–33.
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