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Review

# Tourism and Environment: Ecology, Management, Economics, Climate, Health, and Politics

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**Abstract:** We review research on tourism and the environment using a temporal framework, distinct from previous reviews. We identify six main phases, all still active, but with different histories. Initially, tourism was treated as a low-impact component of transport and urban accommodation, and the focus was on recreation, ecology and visitor management in parks. Interest then turned to environmental management and corporate social responsibility: wastes, resources, and ecolabels. The third phase analysed positive economic contributions to conservation by a small number of tourism enterprises, principally through private reserves and park funding. The fourth focussed on climate change and carbon offsets, and the fifth on mental health and human capital. The sixth and newest phase is political. Tourism developers, industry associations, and lobbyists have stepped up their longstanding efforts to gain control of parks and protected areas, in order to profit from preferential access to public resources. These efforts now include international instruments as well as policies, practices, and legislation in individual countries. Tourism has become a catspaw for a new form of land grab by private wealth portfolios for high-value nature property. We draw attention to tourism development land grabs in public protected areas as a key priority for urgent research.

**Keywords:** policy; conservation; marketing; attraction; experience; coastal; parks; psychology



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## 1. Introduction

Our aim here is to review the historical development and current focus of connections between the environmental aspects of tourism research and tourism practice, and indicate research priorities. We identify six overlapping phases, distinguishable by different real-world triggers and the application of different research disciplines. We review earlier phases briefly and examine current phases in more detail.

The relationships between research and reality differ greatly between disciplines. We can distinguish four different groups, depending on the direction and degree of influence between changes in the real world and changes in research knowledge and focus. In fundamental disciplines such as physics or chemistry, research aims to understand and use how the real world works, not to change it. In professional disciplines such as medicine or law, research and practice are closely integrated, and knowledge and influence operate in both directions. In policy disciplines such as national security, real-world changes can be very rapid, and research aims to analyse trends and patterns, but rarely to influence them. The same applies in industry disciplines such as forestry or tourism, where research follows changes in the sector, but has little practical influence [1].

Most tourism practitioners read online newsletters, e.g., those advertising commercial opportunities or equipment designs, but they are not interested in academic theory. Physicists routinely read and rely on physics journals, and lawyers read law journals as well as case reports and annual digests, but tour operators generally do not read tourism research journals. Tourism researchers, editors, and reviewers value theories of tourism, but tourism practitioners do not. Tourism research applies disciplines such as economics,

geography, and psychology, within a tourism sector context. Tourism research exists as an identified academic discipline because tourism researchers persuaded publishers to start journals, and research agencies to recognise discipline codes.

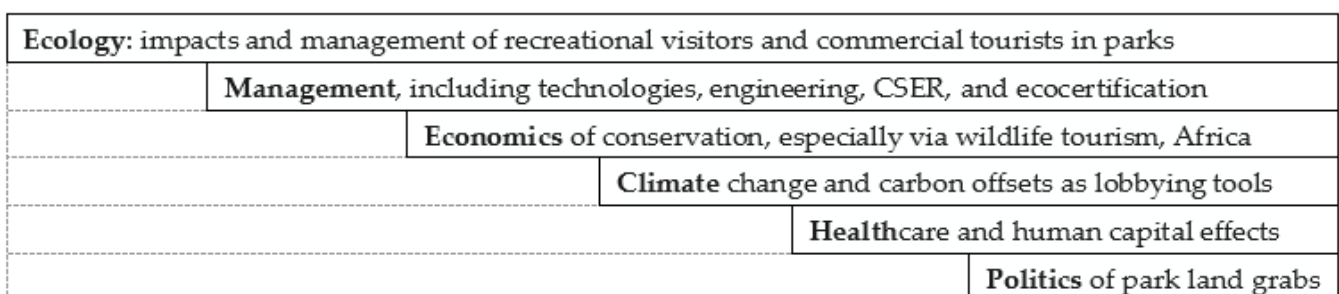
This analysis attempt to identify connections between research and real-world changes. It relies on practitioner experience as well as research publications. It is not a systematic or bibliometric review, which are now generated using digital literature searches and automated pattern analyses. A number of these are available [2], but they generate rather different outcomes, which casts some doubt on their reliability, even retrospectively. They can only identify and predict real-world trends where there is (a) relevant research published in advance of real-world recognition, e.g., regarding climate change; and (b) rapid uptake of research, e.g., as for quantum computing. These do not apply to tourism and environment, where the relationship between research and reality is rather limited and loose [1]. A practitioner perspective can thus provide insights that a bibliometric analysis cannot.

We focus on one research subfield, tourism and environment. This is a component of both tourism and environmental research, published partly in each. We identify six phases in research focus, linked to real-world practical and political changes. This is a different approach than a previous review [1], which identified five mechanisms by which tourism is connected to sustainable development, but without any explicit time dimension. Here we focus only on the natural environment, and adopt a deliberate historical framework.

The six phases, considered in more detail below, may be named as follows (Figure 1):

1. Ecology: of recreation and park visitor impacts.
2. Management: of wastes and resources, advertised via ecolabels.
3. Economics: of contributions to conservation by some tourism enterprises, principally through private reserves and park funding.
4. Climate: consequences of travel and tourism for climate change, and lobbying and marketing measures to maintain tourism income.
5. Health: psychology and economics of tourism's contribution to mental health and human capital.
6. Politics: efforts by tourism advocates to gain control of parks and protected areas, to profit from preferential access to public resources.

The historical sequence is approximate, and represents the relative timing of major research attention to each topic. For most of these phases, there were also earlier publications, but with limited take-up initially. This sequence aims to reflect how attention to relevant real-world issues in tourism and environment triggered surges in research interest and activity.



**Figure 1.** Historical sequence of six major topics in tourism and environment research.

## 2. Ecology of Park Visitor Impacts

Long before tourism was recognized as a research discipline, national park staff were required to consider and control the ecological impacts of park visitors. The earliest publications focussed on managing wildlife [3], to reduce risk to visitors [4]. That progressed to managing visitors [5,6], and monitoring ecological impacts [7,8], to achieve condition targets [9]. This gave rise to a number of named management frameworks and a toolkit of management measures, including fees, regulations, education, and hardening via infras-

structure. Most recently, the global conservation significance of wilderness [10], and the role of management as stewardship [11], have received attention.

This progression of interests gave rise to a field of research known as recreation ecology [7,8,12]. This aims to measure multiple ecological impacts, on different ecosystems, of people engaged in various recreational activities, under a wide range of circumstances. That includes testing and comparing the effectiveness and cost-effectiveness of management measures. Many of these tests reflect the fine levels of detail available to park managers, such as group sizes, equipment, design and construction of trails, regulations and fees for camping and campsites, precise wording and coloration of interpretive signs and maps, and many more. There are comparisons of ecological impacts between similar plant and animal species and communities on different continents, and between park visitors and tourists with different interests and social and cultural backgrounds.

This field evolves constantly to include new activities, equipment and practices by park visitors. These may include illegal activities, such as practitioner construction of competitive mountain bike routes, and fixing-gear for rock climbing in closed areas. It also reflects legal but high-impact social trends, such as over-tourism and queues for Instagrammable® photos at iconic sites. Many parks, for example, received historical-high visitation surges during breaks in pandemic lockdowns [13].

### 3. Management and CSER

The second phase was triggered by overdevelopment of tourism resorts, especially along coastlines, leading to environmental degradation and consequent loss of amenity, and hence to reduced prices, volume, and profitability [14]. Whereas urban hotels are connected to public utilities, resorts in more remote areas are not, and many lacked basic waste management facilities. Resorts discharged sewage onto coral reefs, for example [14], and some still do [15,16], destroying their own prime attractions for snorkelling and diving. This forced the commercial tourism industry to consider waste and environmental management across the entire industry [17,18], and later for specific subsectors [19,20]. This has now been repositioned within the United Nations Sustainable Development Goals [21].

Research topics in tourism environmental management [11] include environmental technologies and engineering; educational approaches, e.g., to reduce water consumption; marketing measures, such as eco-certificates and other ecolabels; drivers and degrees of uptake for various forms of corporate social and environmental responsibility (CSER) and management programs; and correlations and causal links between environmental and financial performance [22,23].

For major tourism developments which are connected to urban power and water supplies, and sewage and waste management systems, the technologies they use are not specific to tourism. Self-contained tourism operations, such as remote lodges and mobile tours, are necessarily more inventive. For example, they use various locally designed and constructed evaporative cooling systems, sewage digestion systems, and solid waste compaction systems. For outdoor tourism in parks and reserves, a variety of human waste disposal systems have been devised. Many remote lodges switched to banks of solar panels for their power supplies, long before these were scaled up to mainstream renewable energy sources.

Educational approaches are widespread, e.g., to reduce water consumption either by changing tourist behaviour directly, or increasing tourist acceptance of reduced over-servicing, such as daily laundry and five-gallon toilet flushing. These are especially important where resources such as water are local and limited, e.g., in remote lodges in desert ecosystems. They are also adopted in urban tourism developments, to reduce staff salary costs in hospitality service, and add to marketing via ecolabels.

Tourism ecolabels originated when historic hotels in or near protected areas aimed to improve their political positions, by presenting purportedly green credentials. Large urban tourism and transport corporations followed other industry sectors in adopting the terminology of triple-bottom-line (3BL) reporting, and corporate social and environmental

responsibility (CSER). Much of this has proved to be greenwashing. Tourism ecocertification programs were supposedly established to differentiate reliable from unreliable CSER claims, but many of the labels themselves are weak, and so are higher-tier programs purportedly accrediting ecocertification programs.

Ecocertificates and other ecolabels are now very widespread, more so in tourism than many other sectors. The large number reflects the variety of different languages, and the very local scale of many programs. There are national programs, but few international ones. Ecolabels can be divided broadly into consumer-benefit labels reflecting environmental quality and health, and social-benefit labels reflecting environmental management and performance. Their environmental value is reduced by multiple mechanisms: the groucho effect at enterprise scale [24], goldilocks effect at program scale, and rottkäppchen effect at sector scale [25]. Ecolabels are used more in negotiations with government permitting agencies than for marketing to individual consumers.

There are numerous different drivers for CSER, not mutually exclusive. The main one seems to be political. Companies that have been critiqued publicly for negative social or environmental impacts, or are considering new socially or environmentally damaging developments, are likely to adopt and advertise CSER programs to counteract poor public perceptions. Possible cost reductions and improved efficiencies are often mentioned, but seem to be rationalizations rather than real motivations. Some enterprises are driven by their owners, or influential staff or stakeholders, and subsidiary premises may be required to follow an overall corporate protocol.

In tourism, as in other sectors, research on CSER has focussed strongly on links between social, environmental, and financial performance [22,23]. CSER is seen principally as a profitable signal to customers, shareholders, and other stakeholders. Links between financial and environmental performance are heavily analysed in a number of sectors, including tourism, and in a number of countries, especially in Europe where corporate reporting regulations require routine social and environmental as well as financial reporting.

#### 4. Economics of Conservation

Whilst tourism economics is a major component of tourism research generally, the economics of tourism and conservation arose from the ecotourism subsector specifically, through debates as to whether ecotourism could generate a net positive outcome for the natural environment [26,27]. These debates date back several decades. Since some negative ecological impacts are unavoidable despite management, an overall net positive is only achievable if ecotourism creates conservation gains that outweigh those impacts. The principal mechanism for any such benefits is via funding for biodiversity protection. The economic scale of these contributions thus became an important topic. The overall economics of conservation is a much broader field, but here we focus only on the provision of direct funding from tourism.

There are multiple mechanisms by which tourism can contribute funding to conservation [28–30]. These include protection of ecosystems, by purchasing private land for dedicated reserves, establishing partnerships in communal lands, or payments to parks agencies. They include protection of individual species, through anti-poaching measures, veterinary services, breeding programs, and translocations. They also include indirect approaches which fund local resident rural communities to support conservation rather than livestock, bushmeat hunting, or poaching of threatened species. Many nature and wildlife tourism operators have adopted some or all of these approaches to various degrees, but it can be difficult to determine whether they generate net positive contributions. For example, collections of captive animals, marketed as breeding or veterinary facilities, may in fact be a front for poaching. Some examples, however, have clearly made substantial contributions to the survival of individual threatened species [30].

In some countries, inbound international tourism is a major source of operating revenue for parks agencies. As a result, numerous threatened species rely on tourism for their continued survival [30]. This creates risks when tourism revenues decline, as occurred dur-

ing the COVID-19 pandemic [31]. Most recently, the economic scale of nature-based tourism has been revisited [32], together with the economic scale of mental health exports, and the various different types of valuation ascribed by parks and nature tourists [33]. Research on economic aspects of tourism and conservation is thus experiencing a resurgence.

## 5. Climate Change and Carbon Offsets

Tourism is a substantial contributor to global climate change, principally through jet-engine air travel. Early research in this field [34–36] focussed on the impacts of climate change on tourism, but this soon evolved [37] to consider the contributions of tourism to climate change [38,39]. Various measures have been proposed to improve efficiency per passenger kilometre, but none have been sufficient to counteract the continuing growth of the airline industry [39]. Aircraft manufacturers, airlines, and the tourism industry all profit from this continuing growth, so they want to maintain it.

They have therefore gone to considerable lengths to promote carbon offsets, by which a passenger can claim to have counteracted the climate change effects of their air travel or other components of tourism. At best these offsets are technically weak or useless [40–42]; at worst, they have negative net effects, by stalling legal, technical, and political measures to reduce emissions [43]. They are marketed as if they physically remove the carbon dioxide emitted into the atmosphere by engines, energy generation, or manufacturing, but in reality they do not even vaguely approximate that. They are based on the concept of substituting an unrelated low-carbon project for a potential high-carbon alternative, e.g., renewable energy such as hydroelectric dams, instead of fossil fuels [41]; tree plantation instead of old growth logging [42]; or changed land management [44,45].

These, however, are rarely real-life substitutes. Large dams cost orders of magnitude more than the funds available from carbon offsets. If they are built, they would be built anyway. Offset payments are extra free cash for the developers. Similarly, nearly all timber plantations are on land that previously supported native forest. That forest is logged first, yielding high-value hardwood, but greatly damaging the forest soil and ecosystem. Then a fast-growing softwood is planted for a quick second cash crop, further damaging the soil, and also acquiring offset payments. Offsets based on improved land management have proved to be ineffective scams [44,45]. The market for carbon offsets is thus not a market for removing greenhouse gases from the atmosphere, or even reducing them. It is a market for development corporations, brokers, and consolidators to pretend that is what they are doing, convincingly enough for at least some consumers to pay, and for regulators to delay regulation. Delays are the real goal of offsets.

There has indeed been a major increase in the scale of renewable energy sources, such as onshore and offshore wind, wave, and solar energy, and in the adoption of electric vehicles in urban transport. These are driven by a combination of public investments, public subsidies and tax incentives, and private profit opportunities. They are little, if at all, influenced by any potential funding streams from tourism climate-change offsets, which remain as a political marketing device to maintain the volume of air travel. As the ineffectiveness of offsets is reported more widely, however, we can expect to see new political lobbying approaches, and a new wave of related research.

## 6. Health and Human Capital

Tourism is a discretionary activity, where tourists spend their own time and money to improve their own satisfaction and self-perceived wellbeing. At least in some cases, this can also improve their physical and mental health, as measured externally. Early research in this field took either public-health or tourist-psychology perspectives [46,47]. This was followed by a new and continuing surge of research on tourist wellbeing [48], including mental health [49].

Since poor mental health has wider costs to human societies, improvements in mental health have a broader social and economic value, beyond their importance to individual tourists, and these values are measurable. The two most immediate components are, firstly,

reductions in healthcare costs, and secondly, increases in human capital and, consequently, in economic productivity [50]. Mechanisms and outcomes have been analysed in most detail for outdoor nature-based tourism, such as visiting national parks or taking part in specialised wildlife tours.

Links from nature to mental health, not specifically related to tourism, have now been analysed and reviewed in considerable detail [51–58]. The role of tourism has been identified, but, as yet, rarely quantified [50]. Tourism research has contributed to the broader mental health field, since most tourism experiences are brief, and can hence be used as interventions to measure the duration of wellbeing effects [59,60]. Some tourism marketing campaigns, e.g., in Chile, now include mental health benefits; some mental health therapy programs, e.g., in Australia, use tourism business models as a form of lifestyle medicine; and some countries, notably China and Italy, are now connecting nature tourism and recreation infrastructure to public mental health [61]. This field of research continues to expand [62].

Some countries, such as the UK, have also trialled so-called green prescriptions [63,64], but these are as yet ineffective, since they are too short, and lack the logistics and guiding components that the outdoor tourism sector routinely provides. To date, the healthcare industry has not adopted outdoor tourism enterprises as healthcare providers, and the tourism industry has not restructured nature tourism products as healthcare products [61,63,64]. The main barrier is the necessarily complex process for testing, approving, and funding new medical treatments within national healthcare systems. This requires the construction of prescriptible products, customised to patients and their symptoms, and subject to randomised controlled trials (RCTs) to test their effectiveness and cost-effectiveness relative to existing approaches based on counselling and pharmaceutical treatments.

To carry out such RCTs, however, we first need less rigorous but more flexible data, qualitative as well as quantitative, that shows how nature therapies based on outdoor tourism products can best be designed for different patients. The nature component includes the following: setting, activity, duration, intensity, frequency, guiding, and interpretation, including sensory and emotional choreography as well as safety and navigation [65–68]. The patient component includes gender, age, life history, and various aspects of personality [69–73]. Such research is in demand, as nature is seen as an inexpensive public health resource to restore the substantial declines in mental health during the COVID-19 pandemic [74,75].

## 7. Political Land Grabs

Opportunities and conditions for commercial tourism operations inside public protected areas have been contested and controversial for many decades, with different histories in different countries. In a few countries, notably Australia, the political context has shifted recently to permit a new form of land grab [76], stealth privatisation of high-value property inside public national parks [77], with tourism as a catspaw. This process transfers property rights from public taxpayers to private wealth, with net negative public environmental, social, and economic outcomes, and increased costs of conservation [78,79].

These new political manoeuvres range in scale from local to national and international. They include: individual enterprises and subnational jurisdictions; new policies, practices, and legislation in individual countries; and attempts to influence international protected-area policies, via instruments such as resolutions by the IUCN and the Convention on Biological Diversity (CBD), notably the Kunming–Montréal Protocol of CBD COP15 in December 2022 [80].

There are different historical paths for private fixed-site tourism accommodation and infrastructure in protected areas, for different land tenures in different countries [81,82], and present-day patterns or signatures in each country can only be understood in the light of those historical paths. There is a published comparative analysis for World Heritage Areas [29], but similar considerations apply more broadly.

Differences between countries reflect social and legal histories of land use in rural and wilderness areas, prior to the establishment of national parks. In mountainous areas with unreliable weather, for example, huts and cabins were constructed for safety by shepherds and later by mountaineering clubs. Some of these were later removed, but some remain operational, and represent one major category of private development in public parks, especially in the USA [29]. Countries differ greatly in legal and social rights of way or rights to roam over private pastoral lands [83], and these differences have carried over to expectations for public protected areas. In the USA, a history of westbound travel using outfits, horses and bullock wagons, led to commercial outfitters providing logistics for national park visitors. Early expansion of railways in the USA and Canada triggered the construction of hotels, and some of these are at national park gateways, either just outside or just inside park boundaries. Some of these still exist as operational heritage hotels. Some have been used as political levers to expand private facilities and profits, e.g., to build conference centres and residential villages.

In eastern and southern Africa, tourist accommodation in wilderness areas originated from commercial hunting safaris, later largely replaced by photography safaris and wildlife-watching tourism. Land tenure types differ between countries. They may include private and communally owned as well as public lands, and designated Wildlife Management Areas as well as national parks. There are now numerous small-scale but up-market camps and lodges across all tenures, with different rules in each country and region. Some of these are inside national parks, but are under strict rules relating to minimal impact and physical footprint, short leases followed by full removal, and high permit fees. In some African countries, for example, over 80% of the entire national park budget for the country is paid by tourism revenues. In India, whilst some private and forest reserves include visitor or tourist accommodation, public national parks require that all accommodation is outside and visitors must enter and leave daily, with a very strict exit curfew time. In China, previous private tourist accommodation inside some national reserves has been removed by the parks agency.

In some Australian national parks, there are a few isolated buildings pre-dating park establishment. Many have been removed as part of park management plans. Of the few remaining, most are hiker huts maintained by parks agencies. A few are heritage structures such as lighthouses, leased for tourism to cover maintenance costs [29]. Recently, however, a new political pattern has emerged, the construction of new private tourism lodges inside national parks [77]. This is extremely controversial, is driven by property development interests, and has involved extensive litigation. Historical attempts were either rejected, or failed, and were bought out and/or rehabilitated at taxpayer expense [29]. This may yet happen to the new developments, but the investors have gained large-scale public subsidies and have little to lose. In addition, the new developments are held within corporate structures such that they can be sold to wealth management funds, essentially as a property play. This has already happened in at least one case [84].

Overall, we are seeing political manoeuvres used to transfer public lands of high value for conservation and recreation, to private owners, at far below market value—and indeed, often subsidized by taxpayers. Not surprisingly, this creates powerful public objections, but the new owners do not care, since their target market is wealthy foreigners making single visits. These new developments also gain some control over public park infrastructure, restricting use by mobile park tour operators and independent park visitors. Net environmental, social, and regional economic outcomes are all negative [77]. The political context for these new developments is complex. It includes lobbying by state government tourism portfolios, competition between states to attract wealthy tourists, and sweetheart deals between governments and preferred developers. This is not a sudden or localised pattern. It is the outcome of at least 35 years of political manoeuvring by tourism development interests.

In addition, tourism industry interests were represented at the 2022 Kunming–Montréal Conference of the Parties, COP15, of the Convention on Biological Diversity, CBD. Indus-



try submissions included one from the World Travel and Tourism Council, the principal international tourism industry association. That submission called for new tourism developments inside national parks, with no justification, and no mention of payments for such privileges [80]. WTTC has a hierarchy of membership levels, with a Chair, 13 Vice-Chairs, and 26 Executive Committee members [85]. One of these is CEO of an international tour provider and packager, which has purchased a major stake in the proponent corporation for a proposed new private tourism accommodation development inside a large popular coastal national park in Australia [86]. The park was declared through years of effort by local conservation NGOs. Local residents and tour operators are strongly opposed to the proposed new development, which was originated by the state government tourism agency.

Research on these new political manoeuvres is hampered by secrecy. Governments release vaguely worded policies without consultation, and property developers act clandestinely until they have obtained legal rights, or indeed until bulldozers arrive on site. In this regard, the large-scale tourism development sector behaves very like the mining and forestry sectors. The principal source of information is from transcripts of evidence in lawsuits brought by residents and NGOs, but very often those are not available until it is too late. An alternative source is to interview stakeholders. Government and industry sources may not be forthcoming, but the opinions of residents, park visitors, and mobile tour operators are readily recorded. To date, this is a new and restricted field of research. As parks agencies, conservation advocates, and local resident communities become more aware of these new risks, however, we can anticipate that research will expand correspondingly.

## 8. Conclusions

The approach taken here provides a different perspective from earlier reviews and analyses [1]. It argues for historical shifts in research emphasis between ecology, management, economics, climate, health, and politics, each driven by real-world changes. All six research themes remain relevant and active, with a resurgence of activity related to climate change and carbon offsets, and a strong and rapidly expanding field related to the role and opportunities for tourism in health and wellbeing.

We can also identify the politics of land grabs by private tourism property developers, inside public protected areas, as the critical new topic for future research. Australia is a test case at present, but every country has its own political context. It will be interesting to see whether the companies concerned experience international boycotts once their activities become more widely known. At present, research in that field lags behind practice. The earlier research phase on the economics of ecotourism contributions to conservation, however, is also relevant, so the new field does not have to start from scratch.

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