

Environmental Impacts of Ecotourism

A review of literature

by

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The International Ecotourism Society (TIES) characterizes Ecotourism as “responsible travel to natural areas that conserves the environment and sustains the well-being of local people”. Environmentally sound travelling has reached significant importance in the last two decades as an environmental and social sound alternative to destructive activities on forestlands like timber exploitation, slash and burn or poaching. Nevertheless, ecotourism activities can also have considerable, negative impacts on environmental conservation and social well-being of local communities. Furthermore, many ecotourism activities occur in pristine areas with highly sensitive environments and cultures which are especially vulnerable to human influences.

Forest ecosystems are of particular interest for many “green” tourists. Although ecotourism operations do also take place in deserts, savannahs or on the sea, ecotourism is closely related to forests. *The Food and Agriculture Organization (FAO)* characterizes forests as “ecological systems with a minimum of 10% crown cover of trees and/or bamboos, generally associated with wild flora and fauna and natural soil conditions”. Natural forests with spectacular plant and animal species are most attractive for Ecotourism.

In this document, environmental and socio-economic impacts are characterized as net changes, whether beneficial or detrimental, in the environment and the socio-economic conditions, brought about directly or indirectly by human action and its effects.

This paper serves as a very comprehensive summary of environmental and social impacts of ecotourism, which have already been identified and partly analysed by other authors in former reports. Its purpose is to highlight the most severe threats of Ecotourism and relate them to their direct sources. The paper does not claim to be complete nor inform about the highly complex interconnections of sources and impacts. As mentioned above, only the most severe impacts of Ecotourism on the environment and social well-being shall be analysed. The importance of these impacts is assessed according to: probability of occurrence, magnitude (amount of change), extend (area affected), time frame and irreversibility (permanence of change). Impacts for tourists are not considered in this document.

The tables below proceed from a situation without any destructive human activities on nature and social well-being of local people. From this (theoretical) starting point, they identify the impacts, ecotourism activities could cause on such environments. This is the reason why the tables mainly concentrate on negative impacts. Nevertheless it is also very important to regard ecotourism from another point of view. Due to its financial benefits for local communities, Ecotourism can be considered as an alternative to other activities in remote areas like clear cutting, slash and burn, cattle ranching or mining, which are often much more destructive.

Fauna

Impact	Source
(+) Improved knowledge/data about animal distribution and behaviour	<ul style="list-style-type: none"> - scientific research on wildlife is more intensive in Ecotourism areas due to increased public awareness - financial gains of Ecotourism are partly used for scientific research
(+) Locals promote the protection of wildlife	<ul style="list-style-type: none"> - locals, working in Ecotourism, gain a better understanding on wildlife and change their views concerning the value of fauna because: <ol style="list-style-type: none"> 1. they recognized their dependence on wildlife 2. feel personally connected with wild animals and/or admire them
(-) Decline of rare or spectacular species	<ul style="list-style-type: none"> - introduction of exotic species by tourists - capture and killing of rare animals for souvenirs - keen wildlife tourists prefer to seek out rare or spectacular animals for observations and photos which increases stress on them
(-) Habitat alteration/destruction	<ul style="list-style-type: none"> - road, track, campsite and lodge construction - extraction of fuelwood - forest fires caused by tourists (accidentally) - vegetation clearing in order to provide better views for tourists

<p>(-) Death of individual animals</p>	<ul style="list-style-type: none"> - hunting - vehicle accidents - bigger animals, which have become habituated to humans are killed in order to prevent potential tourist injuries and damages to vehicles and campsites - animals may die after they have been startled by tourists
<p>(-) Spread of epidemics and diseases</p>	<ul style="list-style-type: none"> - humans or exotic animal species, which have been introduced by Ecotourists may transfer disease-causing agents to animals (Example: Mountain gorillas are very susceptible to human viruses and bacteria)
<p>(-) Unnatural and unhealthy food dependency</p>	<ul style="list-style-type: none"> - feeding by tourists - inappropriate waste disposal and dumping places, which are easily accessible for wild animals
<p>(-) Unnatural concentrations of wildlife</p>	<ul style="list-style-type: none"> - establishment of artificial assistance like water holes and salt licks - inappropriate waste disposal and dumping places which are easily accessible for wild animals
<p>(-) Unnatural species composition and physical population conditions</p>	<ul style="list-style-type: none"> - establishment of artificial assistance like water holes and salt licks - artificial feeding programmes (mainly during winters or dry periods) - inappropriate waste disposal and dumping places which are easily accessible for wild animals - feeding by tourists - feeding and baiting by guides
<p>(-) Creation of migration barriers (esp. for smaller animals)</p>	<ul style="list-style-type: none"> - road, lodge and campsite construction

<p>(-) Alteration of animal distribution (spatial and temporal displacement) and behaviour</p>	<ul style="list-style-type: none"> - tourist overcrowding - wildlife viewing on inappropriate observatory facilities - guides actively seek for rare or spectacular species which are shy by nature - taming of wild animals - animals are caught to show them to tourists - tourists causing stress for wildlife by approaching too close - increased hunting pressure driven by the demand for souvenirs like furs, skins, stuffed animals, teeth or horns.
<p>(-) Increase in scavenger numbers and species</p>	<ul style="list-style-type: none"> - inappropriate waste disposal
<p>(-) Disturbance of predator-prey relationship</p>	<ul style="list-style-type: none"> - human hunting activities - supporting of predators by disturbing preys (Example 1: Night hunting activities of leopards are observed with white spotlights which confuse prey species) (Example 2: King shags and Magellan penguins in Patagonia tend to move away and leave their nests open for attack when tourists are visiting breeding colonies) - tourist traffic may cause shy predator species to avoid favourable hunting sites/times and therefore support less shy prey species.
<p>(-) Alteration of relationship between competing species</p>	<ul style="list-style-type: none"> - waste disposal favours “problem animals” - some animals are more sensitive than others for human traffic (Example: While barking deer, sambar and Sumatran rhino moved away from frequently visited areas in Gunung Leuser National Park in Indonesia, primates, Squirrels and hornbills became habituated to visitors) - spectacular species are visited and disturbed more frequently

<p>(-) Alteration of intra-specific relationships (individuals spend less time for breeding, nursing the offspring or social interactions)</p>	<ul style="list-style-type: none"> - animals are concentrating on tourists and observe their behaviour - tourists are particularly attracted by young animals and want to touch them or separate them from their parents. If separation is prolonged, the young can be rejected by the parents.
<p>(-) Fish decline in enclosed inland water bodies</p>	<ul style="list-style-type: none"> - over fishing by tourists - over fishing for food supply of tourists - unregulated discharge of sewage changes water quality - oil leakage from motorboats leads to contamination of water-bodies - input of detergents, soaps and fecal material changes water quality - sedimentation of water-bodies caused by track/road construction: <ol style="list-style-type: none"> 1. ditches next to roads/tracks 2. erosion on tracks next to water courses or in hilly terrain

Flora

Impact	Source
(+) Improved knowledge/data about plant distributions and conditions	- scientific research on plants is more intensive in areas with Ecotourism due to increased public awareness and financial sources
(+) Locals promote the protection of (native) flora	- locals, working in Ecotourism, gain a better understanding on plants and change their views concerning the value of plants because: <ol style="list-style-type: none"> 1. they recognized their dependence on native flora 2. feel personally connected with vegetation and/or admire plants
(-) Habitat destruction/alteration	- road and campsite construction - forest fires caused by tourists (accidentally) - logging for construction and fuelwood supply - eutrophication caused by soaps, detergents and human fecal material - soil contamination through burying of non-biodegradable litter such as glass bottles, aerosol cans, batteries and plastic bags
(-) Reduced plant density and decrease in biomass	- trampling - road/trail construction - campsite/lodge construction - cutting of vegetation in order to gain better views on wildlife - forest fires caused by tourists (accidental)

(-) Altered species composition	<ul style="list-style-type: none"> - trampling - rock climbing (rock climbers do not only damage native species but they also introduce exotic seeds/plant pieces, carried in their shoes, clothing and equipment. - logging for fuelwood supply (certain species are preferred due to their physical properties) - theft of (spectacular) plants for private gardens - introduction of exotic species - collection and selling of rare or spectacular species as souvenirs - increased input of fecal material, detergents and soaps on frequently visited sites cause eutrophication
(-) Reduced plant regeneration	- trampling significantly reduces the survival rate of (tree) seedlings
(-) Displacement of rare species	<ul style="list-style-type: none"> - theft of plants for private gardens - collection and selling of rare species as souvenirs - introduction of exotic species
(-) Mechanical damage on vegetation	<ul style="list-style-type: none"> - removal of twigs and branches along tracks and campsites - driving of nails into trunks in order to put up information for tourists
(-) Exposure of tree roots	<ul style="list-style-type: none"> - trampling - road/trail construction
(-) Reduction of deadwood	- fuelwood collection (especially around campsites and lodges)

Water

Impacts	Source
(+) Improved water quality (for drinking water)	- ecotourism operators invest in chemical or mechanical treatment for water resources for the well-being of both, Ecotourists and locals
(-) Water contamination and reduced clarity of waters	<ul style="list-style-type: none"> - oil and gas leakage from motorboats - burying of non-biodegradable litter such as glass bottles, aerosol cans, batteries and plastic bags - roads are built too close to water-bodies - unregulated discharge of sewage into enclosed water-bodies
(-) Eutrophication and excessive algal growth in inland water-bodies	<ul style="list-style-type: none"> - direct input of soaps, detergents and fecal material - indirect input of fecal material through latrines which are placed too close to water-bodies - unregulated discharge of sewage into enclosed water-bodies - intensive and continual feeding and baiting of fish
(-) Shortage in freshwater supply for locals	<ul style="list-style-type: none"> - water contamination - water eutrophication - increased use of scarce freshwater resources by tourists (especially in hot and dry climates like in African wildlife tourism)
(-) Changing water courses	<ul style="list-style-type: none"> - directly: track/road and bridge construction next to water courses - indirectly: erosion on tracks/roads in hilly terrain leads to sedimentation of water courses

(-) River bank damage	- track construction along rivers
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Soil

Impact	Source
(-) Soil erosion	<ul style="list-style-type: none"> - inappropriate quality and quantity of road and track networks (Example: roads/tracks do not follow natural contours of the landscape) - hikers widen existing trails (this happens particularly after heavy rainfalls) - shortcutting of existing trails creates new trails, which are often very steep - plant removal - human traffic around campsites and overlooks (sheet erosion)
(-) Soil compaction	<ul style="list-style-type: none"> - tourist trampling - horseback riding - (off-road) driving
(-) Loss of organic soil matter	- track/road construction
(-) Soil contamination	- burying of non-biodegradable litter such as plastic bottles and bags, batteries and aerosol cans

Other environmental impacts

(-) Air pollution	<ul style="list-style-type: none">- burning of non-biodegradable litter such as plastic bottles and bags, batteries and aerosol cans- vehicle emissions at key sites
(-) Animal attacks on local population	<ul style="list-style-type: none">- wild animals become used to human traffic and loose their fear of people- wild animal species, which are used to be fed by Ecotourists, like bears or baboons become aggressive, if they do not receive (sufficient) food
(-) Interference with ecosystem energy flow	<ul style="list-style-type: none">- collection/consumption of firewood
(-) Decreasing aesthetic value of the area	<ul style="list-style-type: none">- littering- environmental damages (logging, water contamination, wildlife decline, ...)- overcrowding- increasing infrastructure

Socio-economic and cultural impacts

Impact	Source
(+) Increasing employment possibilities for locals	<ul style="list-style-type: none"> - Ecotourism creates directly jobs for guides, managers, researchers, .. - Ecotourism creates indirectly jobs through tourist demands for food, accommodation, transportation, souvenirs,
(+) Additional regional income	<ul style="list-style-type: none"> - direct gains from Ecotourism operations and entrance fees for parks - indirect gains from local arts and crafts, restaurants, hotels, pubs and the taxes derived from these operations - Infusion of “hard currency”
(+) Improvement of comfort and living conditions	<ul style="list-style-type: none"> - facilities which have primarily been built for tourism (i.e.: roads, trails, lookouts, huts, toilets) can be used by locals as well - improved transportation connections in and out of areas where Ecotourism occurs
(+) Elements of traditional culture are revalued	<ul style="list-style-type: none"> - strong interest of Ecotourists in local cultures
(+) Improved Education for (young) locals	<ul style="list-style-type: none"> - Ecotourism depends on local guides which have to be trained - interactions with tourists lead to an improved general education and language skills - Ecotourism operators offer environmental education for local communities and/or basic education for local children - locals spend considerable amounts of the money, they earned through Ecotourism, for their children’s education

(+) Improved healthcare	- several ecotourism operators support local health facilities or fund regular visits by nurses and doctors
(+) Food and drinking water provision for locals	- Tourist demand for clean drinking water leads to an improvement in water quality and water supply - After killing game, trophy hunters are only interested in trophies and do not care about or are not allowed to consume the meat. Meat, which was left behind could serve as an additional food source for local people
(-) Rapid population increase	- creation of in-migration to Ecotourism sites through improved infrastructure and financial gains for local people
(-) Alteration of local cultural and religious values	- visitor interactions with local communities - growing population - influx of western values (especially in developing countries)
(-) Replacement of native languages and dialects	- communication with Ecotourists is only possible in (inter)national languages
(-) Health problems for locals	- increasing, unregulated discharge of sewage causes spreading of pathogenic bacteria, viruses and protozoa which leads to contamination of drinking, bathing and cooking water. - tourists may introduce (exotic) diseases (Example: influenza) - locals become addicted to alcohol, cigarettes and other drugs which have been imported by tourists or for tourists
(-) Spread of HIV/AIDS	- sex worker and local community interactions with labourers, truck drivers, tourists, ...

(-) Increasing crime rate	<ul style="list-style-type: none"> - the presence of tourists attracts criminals to move into the area - locals may become criminal when confronted with rich tourists
(-) Local Inflation – prices for labour, land and locally produced goods rise	<ul style="list-style-type: none"> - tourism demand (especially during peak seasons or in frequently visited areas)
(-) Increased dependence on foreign investment	<ul style="list-style-type: none"> - Ecotourism is a major income source - many locals exclusively concentrate on tourism for financial gains and give up additional income sources
(-) Seasonability of jobs	<ul style="list-style-type: none"> - Seasonability of Ecotourism (peak seasons and low seasons)
(-) Disruption of local social relationships	<ul style="list-style-type: none"> - jealousy among locals due to uneven distribution of (financial) benefits derived from Ecotourism - growing population - visitor interactions with local population - influx of western values
(-) Alteration of the local population’s eating habits	<ul style="list-style-type: none"> - visitor interactions with local population - influx of western values - tourism demand for “exotic” nutrition leads to imports of food
(-) Reduced satisfaction of locals	<ul style="list-style-type: none"> - overcrowding - disruption of local social relationship - increased inflation - increasing commercialization - leakage of financial benefits out of the region (Example: guides, food and building materials are introduced from other regions) - Ecotourism operators do not pay fair salaries to local employers

<p>(-) Confrontation and aggression between tourists and locals</p>	<ul style="list-style-type: none">- inappropriate behaviour of tourists (Examples: tourists are taking pictures of locals without asking them for permission, inappropriate behaviour and dressing or undesired entering of cultural or religious sites, littering, air pollution, tourists haggle about prices, ...)- spaces, traditionally used by locals coincide with locations, set away for ecotourism activities- locals are only interested in economic benefits from ecotourism, and feel abhorrence at tourists, their behaviour and their cultures
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