The Tourism Sector in Transition

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1. Introduction

Tourism has a long history, and can be traced back as far as the Roman empire, when elite members of society were known to travel for pleasure.[1] In the 16th and 17th centuries, tourism became fashionable among the European upper class with the traditional 'grand tour' through Europe.[2] Transportation however remained slow and expensive, putting travel for pleasure out of reach for nearly everyone. This changed with the development of the fast and cheap railway transport, which led to the rise of seaside resorts and the beginning of a real tourism industry. An important figure in this nascent industry was the first tour operator, Thomas Cook, who played a key role in enabling international travel in the 19th century.[3] Unfortunately, at the time of writing this book, Thomas Cook filed for bankruptcy which marked the end of an era.

In the 20th century, the way we travel and use transportation changed dramatically, and tourism experienced enormous growth. The worldwide increase in tourism was the result of a growing world population, rising GDP per capita, and improved income equity.[4] According to estimates, the industry grew from just over 600 million tourists per year in 1900 to over four billion in 2000, equivalent to continuous growth of 1.9% per year. This growth took place especially after the Second World War. Initially this was driven by the boom in private car ownership, but mass travel over longer distances really took off with the introduction of wide-body jet aircraft.

Today, the tourism industry reports about five billion arrivals per year of tourists who travel domestically (within their own country), compared to over one billion international tourist arrivals.[5] The most common mode of transport overall is the automobile, which is used in 48% of all trips. Travel by airplane accounts for 22% for combined domestic and international tourist arrivals;[6] more than half of all these trips are made by international tourists. This less environmentally friendly mode of transport is growing faster than other, more sustainable ones such as rail and coach, which in addition to travel by ship, provide the remaining 30% of tourist transport.[7] The costs per mile travelled for commercial air travel fell from $0.34/pax-km (passenger-kilometer) in 1937 to $0.067/pax-km in 2010.[8] Sea cruises are a fast-growing niche market with a very large carbon footprint per passenger. CO_2 emissions from sea cruises worldwide are now responsible for about 1.5% of all tourism emissions, amounting to between 1.0 and 1.5 metric tons of CO_2 per passenger.[9]

The fast growth of cheap air travel worldwide was also facilitated by deregulation of the international markets and 'open skies' agreements, which allow unrestricted landing rights between countries.[10] The Netherlands was one of the first countries to implement such agreements.[11] Elimination of visa requirements has also boosted air travel: the World Tourism Organization (UNWTO) calculated that between 2008 and 2015, the percentage of the global population that needed a traditional visa for destinations fell from 77% to 61%.[12]

Economic importance and build-up of the sector

In 2016, the tourism and travel industry directly generated $2.3 trillion in revenue and provided 109 million jobs worldwide.[13] This represents 3.1% of global GDP and about 3.6% of global employment. When indirect and induced financial impacts are taken into account, the tourism and travel sector was responsible for 10.2% of world gross domestic product (GDP) in 2016, and provided approximately 10% of all jobs worldwide.[14,15] Over 150 countries report tourism as one of its top five export earners, and it is the number one export sector in 60 countries.[16] Moreover, it is also the main source of foreign exchange for one-third of developing countries and half of the least-developed countries (LDCs). The sector is widely considered to be crucial for global economic development and job creation, in particular in emerging markets.[17]

A wide range of activities fall under the remit of the tourism and travel industry. Because the tourism system comprises such a diversity of sectors and conditions,[18] in econometric terms tourism is not considered a specific sector, but an amalgamation of elements from other economic sectors. Many countries do not have a separate tourism ministry, or the tasks are shared between multiple ministries. This makes it difficult to govern tourism as a whole and to align its developments with the Sustainable Development Goals (SDGs). The scope of tourism activities includes transportation (railways, airlines, ferries, road travel facilities), accommodation (from campsites to global hotel chains) and many other diverse services as financial exchange services, restaurants, tour providers, guidebooks and navigation apps. Tourism is also characterized by a large number of small and medium sized enterprises: 99.9% of all tourism enterprises in the European Union have fewer than 250 employees.[19]

2. Sustainability issues

Travelers spend money at tourist destinations, thus contributing to the local economy[20] and employment. For a destination, achieving a positive, long-term impact for tourism depends on how it manages and protects its vulnerable environmental resources and is able to create domestic meaningful (economic and social) benefits for the local communities. Unfortunately, the environment is often the first casualty of famous tourism locations. And economic leakage' – especially in developing countries – causes tourism to benefit foreign companies more than local ones.[21]

There are five different categories of environmental impacts of global tourism:[22]

- changes in land cover and land use,
- energy use and climate change,
- biotic exchange and extinction of wild species,
- exchange and dispersion of diseases,
- and changes in the perception and understanding of the environment.

For this chapter we will focus on energy use and climate change and on the environmental and social effects of a relatively new phenomenon called 'overtourism'. Both of these issues pose a major threat to the tourism sector itself and to society as a whole.

Environmental issues

Tourism is directly responsible for 5% of global CO_2 emissions[23] and 8% if indirect and supply-chain emissions are included.[24] A major issue is that the growth of tourism-related greenhouse gas emissions is in conflict with the goals of the United Nations Framework Convention on Climate Change (UNFCCC) of Paris in 2015, the agreement on mitigating climate change.[25,26,27] Besides being a large emitter of greenhouse gasses, tourism itself is also threatened by the effects of climate change,[28] due to the impact it has on coastal erosion, unreliable snow at winter sport destinations, reduced biodiversity and landscape quality and water quality problems. Heat waves and temperature spikes can also make some destinations too hot for tourists. However, these issues have not yet increased awareness and

the feeling of urgency in the tourism sector to think about its own contribution to climate change and have not noticeably accelerated mitigation measures in tourism.

Global tourism CO_2 emissions will likely increase through the 21st century. If nothing changes it is expected that between 2060 and 2070, tourism emissions will exceed the total emissions agreed upon in the Paris climate agreement.[29] Air transport is currently responsible for over half of CO_2 emissions in the tourism and travel industry, and this share will increase to 75-80% by the end of the century.[30] Furthermore, dealing with the increasing carbon footprint of tourism, especially its 'long haul' component (which is long-distance air travel), is a major challenge.[31,32] Some proponents argue that this environmentally unsustainable growth of tourism is justified by its socio-economic benefits; they assume that increasing travel distances will have a positive effect on the economic development of many Least Developed Countries (LDC's in short).[33,34] However, studies showed that reducing maximum travel distances would on average make little difference, as it could both benefit and harm LDCs. [35] Some distant destinations, mainly very small island states, would indeed suffer from a reduction of long-distance air travel, but other LDCs – mainly larger countries – would benefit from such a development because more people would travel domestically or from neighboring countries.

Socio-economic issues

The success of tourism in some locations appear to become its own enemy with a relatively new phenomenon called 'overtourism'. Overtourism is defined as "the situation in which the impact of tourism, at certain times and in certain locations, exceeds physical, ecological, social, economic, psychological, and/or political capacity thresholds".[36] Simply put, there are just too many tourists at the same in one location. If you have been to Bangkok, Venice, London, Amsterdam or Barcelona during peak season, you know what we are talking about. Critical encounters between residents and tourists have caused 'tourismphobia'.[37] Such phenomena – the negative experiences caused by too many people visiting the same location at the same time – are not new and were already described more than 4 decades ago as 'overcrowding'.[38,39] Overtourism does not only have negative effects on the experience of other tourists or residents, it also degrades the environment and landscape, creates congestion on roads and in public transport, leads to gentrification and increased housing costs, and results in depopulation of city centers.[40] Overtourism is not limited to cities alone. In fact the most vulnerable destinations are coastal zones, islands, nature reserves, rural areas and natural or cultural heritage sites.[41] According to McKinsey & Company and the World Travel & Tourism Council (2017) there is currently a list of over 100 overtourism destinations worldwide.

The most important causes of overtourism are the falling costs of air transport, and the rise of sharing economy platforms (like Airbnb) and review sites (like TripAdvisor, or even Instagram) which spread the word fast and attract others to come to the exact same location and tend to concentrate tourists at a small number of popular destinations.[42] Although cheap, long-distance air travel has provided world-wide accessibility to even the most obscure tourist destinations, platforms like TripAdvisor have focused interest on only a few major destinations. This has resulted in hyper-promotion of these destinations and ultimately in overtourism. Governance of overtourism, for example limitation of tourism at a specific destination, is also hampered by the sharing economy platforms as shared accommodations are often not officially registered, regulated and generally pay less or even no tax.[43]

3. The rules of the Tourism game

Most of us love to travel, enjoy our holiday and see other parts of the world. Tourism is also an important economic factor for local economies and it has the potential to discover other cultures and connect people from all over the world. However, its chronic problems like excessive $C0_2$ emissions, overtourism, degradation of tourist destinations – make further growth very costly in social and environmental terms. It begs the question how come this large, diverse, fast growing sector is not able to become more sustainable. What are the underlying causes of this situation?

Let's look at the rules of the game in the tourism sector by looking at the four loops that are driving the collective behavior in the sector.

Loop I: Market dynamics

In the tourism industry, most actors compete on the short-term gains. Every season, the hotel rooms, the restaurants, the beds, the trips need to be booked full. A room not booked, a seat on an airplane not filled, a trip not taken is a loss for ever. You need to get the tourist in now. With all the websites nowadays, everyone has instant access to all information. Consumers are now able to track and compare prices across multiple platforms and ratings of services to find the cheapest flight and hotel available. The consumers want to make the most of their money, and companies and destinations are therefore under pressure to compete with each other to deliver the lowest price possible, now.

Underpinning the desire of many people to travel further is the belief that the longer the distance travelled (not the travel time to get there), the more exotic and interesting the destination becomes.[44]

By offering cheap travel across longer distances in shorter times, the aviation industry has fulfilled this desire. Furthermore, global competition puts downward pressure on prices, which pushes volumes even higher. This has made it very difficult for individual companies and destinations to take a sustainable approach to tourism: all stakeholders are now faced with very low margins and must compete in a mass market where quantity and standardized offering often has priority over quality and certainly of sustainability. This means that externalized costs (e.g. environmental and societal costs) are systematically disregarded. But sooner or later these costs will come due and will damage the long-term interests of stakeholders.

Loop II: The Enabling environment

Tourism means more business, foreign currencies and employment. This in turn means more tax income and more economic development which are dearly needed in all countries. The different ministries that are involved in tourism, are often subjugated to the growth and marketing paradigm to satisfy the short-term economic and social interests of their governments. They must ensure that their national tourism sector remains competitive with many other destinations, even though the destinations are increasingly converging in terms of 'pulls' to engage tourists – such as standardized, very similar accommodations, travel arrangements and experiences. As a result, in most locations, so-called Destination Management Organizations (DMOs), which include tourism boards and visitor bureaus responsible for marketing specific destinations to tourists, deploy a growth paradigm that plays a dominant role in shaping this industry. The growth paradigm usually focuses on volume, meaning arrivals and guest-nights, assuming fixed (low) prices and much less on protecting the environment and reducing overtourism. In addition, the DMOs are very dependent on other powerful parties like the aviation, digital platform and accommodation industries. Without their support your destination can not grow or will not get the attention it needs. The introduction of sharing economy platforms like Airbnb has further eroded the ability of governments and DMOs to ensure balanced development of their destinations. As a result, the DMOs do not have much alternatives but to favor them and play the game along. Many DMOs become aware of the overtourism caused by their growth paradigm only after the stakeholders (inhabitants and tourists) start to protest or when the natural beauty that attracted the tourism in the first place, start to decay.

Loop III: Mismatch benefits and effects

The actors driving the tourism sector, such as travel agencies, DMOs and the aviation industry, but also local hotels and restaurants, all benefit from an ever-expanding growth and volume of the sector. More tourists mean more profits. The effects their activities have on the environment and local residents are often not felt by them, until it is too late.

Furthermore, costs are easily externalized as even the governments who in general are responsible for protecting the public good also have a short term and growth mindset.

Moreover, unlike all other transport modes, aviation is currently not subject to fuel taxes or VAT.[45] There is thus no higher price that can balance the reinforcing loops of planes that contribute to climate change.

Thus, all actors in the tourism industry can pursue their self-interest undisturbed, not feeling the (unintended) consequences that result from them (at least in the short term).

Loop IV: Lack of alternatives

When looking at the conditions to change, we can identify several obstacles to a greener tourism industry. First there are simply not many alternatives for airplanes. Though the large majority of tourism trips is within 1000 km and has viable alternatives for the aircraft, this is not the case for the minority of trips over longer distances that cause the majority of the greenhouse gas emissions. Greening air travel is complex because of the 'system inertia' of the aviation sector. For example, Boeing's next generation of aircraft – the middle-of-the-market airliner (MoM) – is just now entering the preliminary design phase. Assuming a go-ahead for the program is given by 2020, it will take Boeing ten years to develop their new aircraft, which could then enter the fleet in 2030. It will then have to be manufactured for at least 15 to 20 years to generate sufficient return on the project investment. The last MoM aircraft will be scrapped some 30-40 years later: between 2075 and 2090. This means that the global aircraft fleet will continue to use kerosene as a fuel until late in the 21st century. Given this inherent inertia to the aviation sector, a high tax of $1000 per ton of CO_2 therefor only slows down the reinforcing market dynamics loops: emissions will continue to rise.[46]

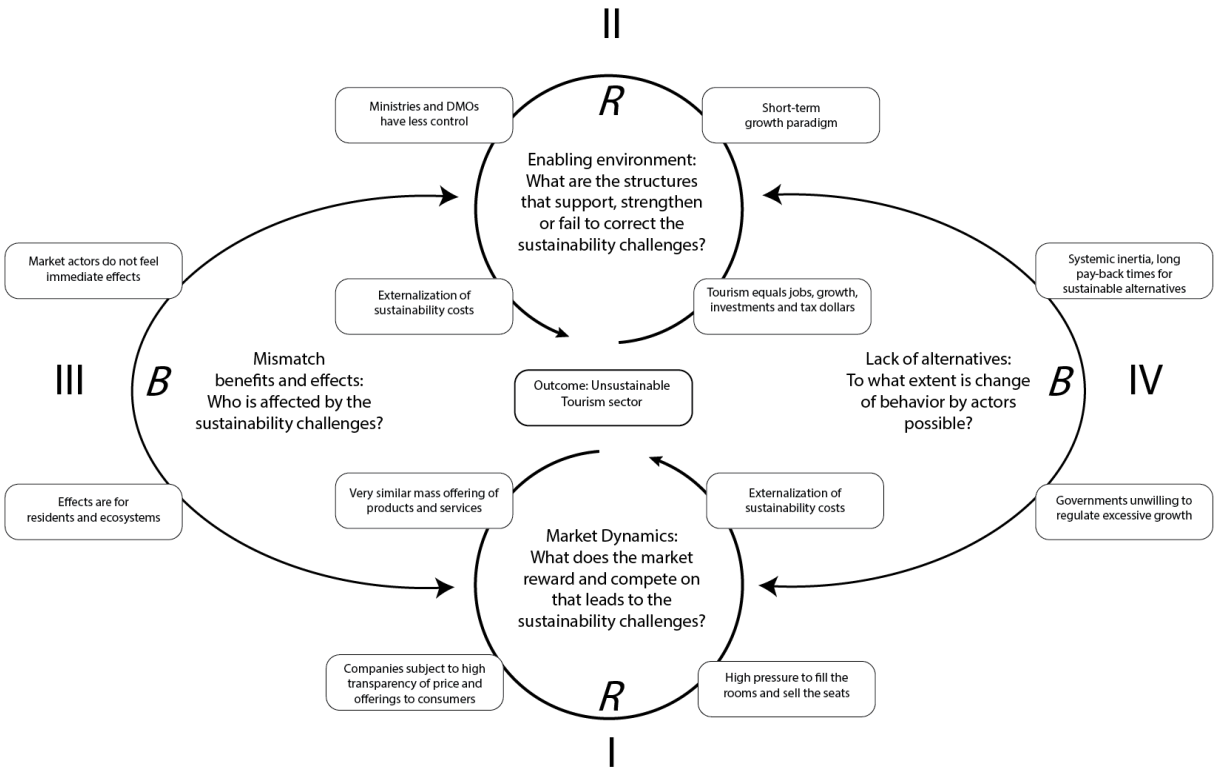
This differs fundamentally from the large, standardized, same-looking mass-hotel chains, with their massive water intensive swimming pools and sauna's that have been built all over the world. Though the lifecycle of these hotels is also several decades, the emissions can be very significantly reduced by changing the heating system, the energy source and by insulating the building. One might expect that there will be an issue with global labor in tourism when tourism is reduced. Fortunately, it is not the number of trips that needs to be reduced, but the average distances travelled by air transport. This may cause a redistribution of labor over different areas in the world, but will certainly not reduce total labor in tourism.[47]

Generally, however, governments appear to be unwilling to regulate excessive growth as the growth paradigm is still widespread among DMOs:[48] they understandably focus on growth in terms of volume, number of visitors and guest-nights, regardless of the impacts it may have. There are no alternatives for the many jobs depending on the tourism industry. Even destinations with severe overtourism problems, such as Venice and Barcelona, hesitate to curb their marketing efforts, or close parts of their destinations to tourism or consider 'demarketing'.[49]

Putting the loops together

As you can see when these four loops come together, they create a system where the outcome is predictable and fixed. The failing enabling environment strengthens the negative outcome of the market conditions and the negative consequences are not being felt by those who are causing them. And finally the lack of lack of alternatives other means of transport, the lack of alternatives for the people whose job and livelihood depend on it, and lack of mindset and willingness to deal with the issues at governmental level make this sector hard to change. All four loops together ensure that the tourism sector is and remains a driver for local overtourism and large greenhouse gas emissions.

Figure 1: The systemic loops that lead to unsustainable outcomes in the tourism sector



4. The sector takes action

All four loops together spell out a sector that seems to be stuck in a short term driven, growth obsessed, volume focused game. The sustainability challenges the sector is faced with are natural outcomes of how the Tourism Game is set up. So much is clear. The question is, what is the sector doing about it and in what phase of development are they?

Phase 1: Inception – Actionable alternatives through projects and pioneering

Governments respond to local overtourism backlash

In a growing number of tourism destinations, residents and local governments are increasingly experiencing the negative backlash to several issues associated with overtourism, or related issues such as pollution, that are eroding the attractiveness of their destination. As a result, several initiatives have popped up that aim to address these issues. They are still limited in scope and aimed only at addressing a local issue in the short term. Take for example the case of Maya Bay in Thailand. In 2018, Thai authorities decided to close the bay to let the ecosystem recover from the enormous damage that was done to it in the preceding years. The famous bay received over 5,000 tourists and 200 boats a day, causing pollution from boats and litter, which now has destroyed over 80% of the coral reefs around the bay. Although NGOs had been campaigning to restore its ecosystem for years, the Thai government was reluctant to shut it, as Maya Bay forms an important source of income for the government, generating around $12 million a year.[50] At the time of writing (May 2019), Thai authorities announced the closure is extended until 2021.[51]

Another example is the town of Dubrovnik (Croatia). After being featured in the hit series *Game of Thrones,* the old town of Dubrovnik became a very popular tourist destination. In response, the municipality capped the number of cruise of ships that are permitted to dock each day to a maximum of two, with a total number of 5,000 passengers. From 2019, it also limited the total number of entrants to the old city to 8,000 per day. This policy came in the wake of UNESCO threatening to withdraw the old town's status as a World Heritage Site and increasing complaints from residents

about the overcrowding that was eroding their quality of life.[52,53] The city also established mid- to long-term policy measures in its "Respect the City" plan aimed at developing a more sustainable approach to tourism at this destination.

Werfenweng is a small village in Austria. It is one of a group of 'soft mobility' destinations known as the Alpine pearls. The municipality offers sustainable mobility in the form of car-free tourism, by providing free access to all visitors arriving by train. In this way the village, which has no railway station itself, managed to acquire a 20% share of train arrivals.[54]

These examples show how several local crises in tourist destinations across the world result in local governments taking actions on the issues related to overtourism and environmental damage.

At a global level, things are happening too. To focus attention and resources from the various stakeholders involved on issues around tourism, the United Nations named 2017 as the year of Sustainable Tourism and Development. In the same year, various campaigners also launched initiatives such as the Berlin declaration on 'Transforming Tourism': this civil society initiative calls for more responsible tourism as a key driver of sustainable development globally.[55] As these campaigns and declarations are there to give urgency to the issue it can be considered a Phase I activity.

Carbon offsetting pilots and compensation commitments

Carbon offsetting schemes and projects can also be seen as typical Phase I type of interventions. These offsetting projects are ways through which you can compensate your CO_2 emissions by helping to pay for CO_2 savings elsewhere, like for example planting trees, or helping with the introduction of clean stoves in developing countries. The uptake of these voluntary offsetting schemes has never reached more than a few percent, and only a few tour operators include offsetting in their product. Even worse is that the notion of offsetting has resulted in a disincentive within the tourism industry to take actions that actually reduce their own emissions, such as energy conservation and reducing flying distances. The poor results of carbon offset projects in general have also weakened the case for this approach. Only 2% of over 5,000 projects that have been assessed delivered proven carbon offsets at the amounts promised in the certificate, while 85% of projects clearly underperformed or failed to provide any offset at all.[56]

A promising new initiative in the Netherlands is the introduction of Carbon Management for Tour Operators (Carmatop). This project has delivered the Carbon calculator CARMACAL, a B2B tool that enables tour operators to assess the CO_2 emissions of their products to the level of specific flights and specific hotels. It currently provides carbon footprint estimates for over 500,000 accommodations world-wide and it can specify the emissions of 25 transport modes and flights at the airline and even specific aircraft level. The tool can compare flights on different days, times and airlines; using this tool, tour operators can therefore potentially improve their products or make their product portfolio more eco-efficient. Unfortunately, however, the Calculator has so far only been used as an advanced offsetting calculator, and not to actually reduce emissions.[57]

In Phase 1 we can also find attempts at developing highly specialized technological solutions to reduce CO_2 emissions. One potential solution still in the development stage is the 'power-to-liquids' (PtL) process, which aims to replace kerosene with synthetic e-fuels to create a zero-carbon alternative for fueling a future fleet of over 35,000 aircraft.[58] This could be a potential solution in the far future. When the PtL process is fed with CO_2 captured from the atmosphere[59] and electricity from solar and wind energy sources, the carbon cycle will be closed and flights will generate zero emissions.

And this future may not be that far: At the time of writing (July 2019), the very first all-electric passenger airplane was ordered by an American airline from an Israel-based startup company and is expected to be used for passenger flights in 2022.[60]

However, e-fueled air travel will be costly: total energy consumption per mile travelled by air will be two to three times higher than today, and total costs will be between two and six times higher. This means that with these types of cost increases, the growth of aviation is expected to slow to about half of its current rate. Zero-emission electric aircraft are also in development. These airplanes will probably not be powered by batteries, but by a hydrogen fuel cell system.[61] These developments – the transition to e-fueled jet engines in the next decades and the shift to hydrogen-electric planes towards the end of the 21st century – might lower the CO_2 emission, increase the price of air travel and therefore slow the growth of tourism transport. As of now, these developments are still in phase I of maturity.

Phase 2: Competitive Advantage – Proven business models through innovation and competition

You may have seen them when you stayed in a hotel. Certificates hanging on the wall, claiming the hotel is meeting the highest standards of sustainability and environmental care. Our personal favorite is the sign in the hotel bathrooms that calls on you to help save thousands of gallons of water and tons detergents if we all would reuse our towels one more day. Unfortunately, no matter what we do or where we put our towels, we always seem to receive a new towel and a new packed soap bar every day.

In some parts of the sector, there is now some competition on sustainability in the form of sustainability certifications for hotels. For instance, many national and international schemes offer sustainability accreditation to operators in the tourism sector, such as accommodations and restaurants. These operators then use this accreditation in their branding and marketing strategies. An example of a well-established certification scheme is GreenKey International, which was created by the Environmental Education Foundation based in Denmark.

Governmental stakeholders have also taken up certification of tourism sites. For instance, the EU-Ecolabel, established in 1992 and recognized in all Member States, is also used in the European tourism sector. Furthermore, in 2013 the EU Commission developed the European Tourism Indicators System for sustainable destination management (ETIS), which helps certification schemes measure sustainability. Another example is the Certification for Sustainable Tourism, developed by various institutions in Costa Rica as part of the country's sustainable tourism campaign.

Many certification schemes have been introduced in tourism, but none has reached significant uptake in the market. They remain a local or niche phenomenon. Furthermore, most schemes try to include too many social and environmental issues, which dilutes the effects of the labels and makes them obscure for tourists. Certification systems lack systematic evaluation, and the progress of certified products is often not monitored due to cost restraints. Finally, many studies have shown that the sustainable tourist – the consumer who conscientiously seeks sustainable modes of travel – is almost non-existent. This is caused by the attitude-behavior gap, which is larger in tourism than in most other sectors.[62] During surveys about the importance of sustainability in tourism, most respondents "are aware of tourism's contribution to climate change", but "that for the overwhelming majority, climate change awareness does not appear to influence their travel-related decisions" (Tiller and Schott (2012, p. 21). The many ecolabel schemes that have been implemented in tourism are therefore not very effective.[63]

Within the tourism sector, we also find the more specific niche of 'ecotourism'. This is not a certification as such, but rather a form of tourism that aims to give tourists a more holistic ecological experience, often being situated within or near conservation areas and national parks. It offers specific trips and services centered around experiencing the local nature and/or culture in such a way that some of the tourism revenues help to protect nature.

Overall, it is a concern that the tourism sector is not sufficiently competing on sustainability yet. This is a sign of immaturity and lack of urgency in the sector. Without proper competition between travel agencies, hotel chains, locations and so forth, the market dynamic loop is not really changing, and without it, it will be very hard to make a transformational change. Furthermore, it will make any Phase III initiative doomed to fail. The lack of business drive will ensure that any Phase III pre-competitive action will result in either doing more small projects or it will result in talking clubs where real and substantial action will not be implemented. As unfortunately is the case as we will see in the next paragraph.

Phase 3: Pre-competitive collaboration – Critical mass through coalitions and platforms

There are several Phase III, pre-competitive efforts focused on sustainable tourism, addressing both overtourism and environmental problems. These consist chiefly of platforms, partnerships, councils and associations. However, their impact is currently underwhelming as none of these platforms has significantly reduced greenhouse gasses or avoided overtourism.[64] Here are a few of these platforms.

In recent decades, many international sustainable tourism initiatives have been launched, especially by the UNWTO (United Nations World Tourism Organization). These started with the International Year of Ecotourism in 2002, and include a mission statement,[65] Davos declaration on climate change,[66] a Beijing Declaration on tourism to drive development and peace[67] and a document on tourism and the Sustainable Development Goals.[68] These have however been ineffective in actually making changes to the current issues in the tourism sector.[69]

The UN established the One Planet Sustainable Tourism Program (STP) as part of the 10 Year Framework Program on Sustainable Consumption and Production, and today has over 100 stakeholders from government, civil society and industry. The goal of the STP is to enhance sustainable tourism efforts by 2030. Like previous sustainable tourism projects, the STP website lists a large number of projects, but these are all small, local projects covering a wide range of initiatives. This is unlikely to expedite the global changes needed to solve climate change (e.g. zero emissions by 2050) or even deal with issues such as overtourism (by controlling air transport growth and digital platforms).

In Europe, the Tourism2030 platform has created EcoTrans Europe to pool resources and knowledge of stakeholders with the aim of achieving the 2030 goals for sustainable tourism in Europe.[70] Interestingly, the Tourism2030 resources portal, with 80 sources about climate change and tourism, contains only two sources that mention aviation in the context of mitigating emissions. This crucial topic in sustainable tourism development is only marginally present in this knowledge base.

Unfortunately, so far these phase III interventions have not yet resulted in significant changes and impact on the sustainability challenges the sector is faced with. In our opinion, this is largely because the competition on sustainability is not yet a serious driver. The current market dynamics (loop I) are still too powerful to start expecting real changes by any pre-competitive actions. For this to happen, we will need strong global governance. Current governance of aviation utterly fails to even significantly reduce emissions growth.[71]

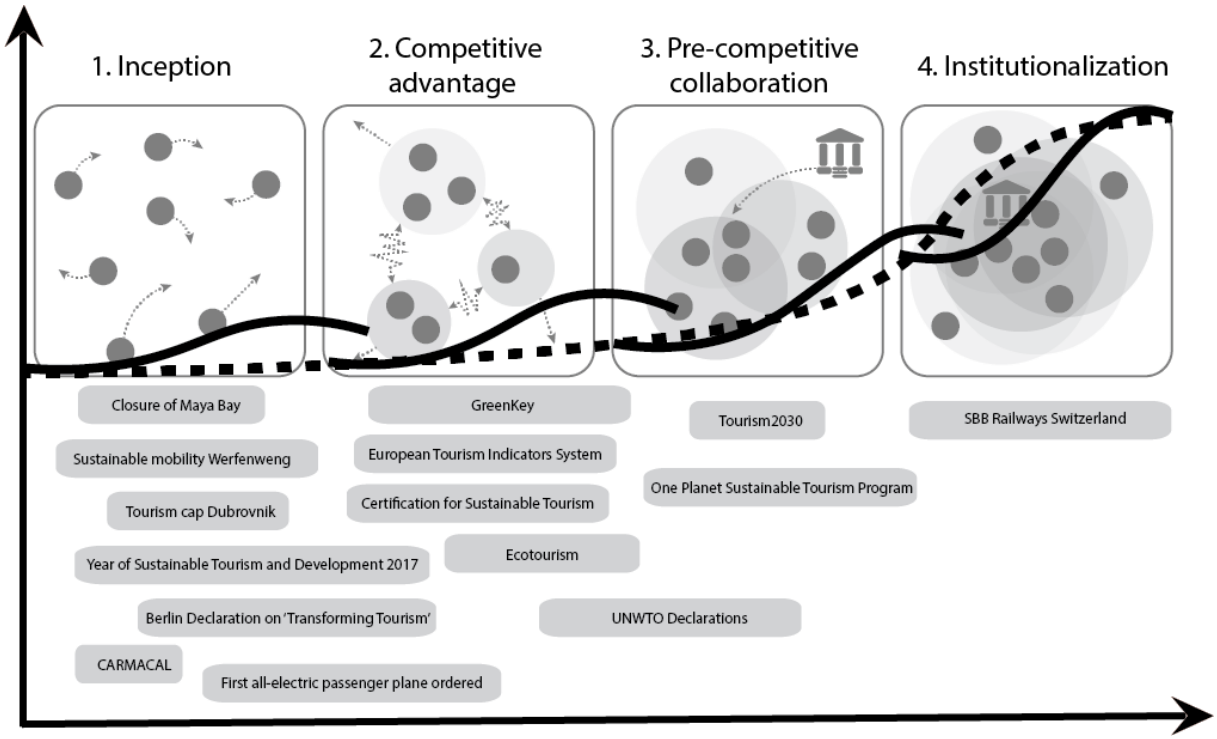
Phase 4: Institutionalization – Level playing field through legislation and coercive self-regulation

The tourism sector for both issues regarding overtourism as well as CO_2 emissions from the transport are not yet in Phase 4 of the market transformation. However, an example from the Swiss railways might show and inspire what structural change might look like if we are able to make sustainable tourism the new normal.

The case of the Swiss railways

More and more railways have started to run their electric trains on renewable energy sources such as hydro, wind or even solar.[72] The Swiss railways, Schweizerische Bundesbahnen (SBB), began generating their own electricity in the 1930s using nearby hydropower plants. The Swiss railways are a unique example of what can be achieved in a world that is no longer very railway-minded. For instance, they provide 16% of all passenger-kilometers in Switzerland and 40% of all freight ton-kilometers while using only 4% of the country's transport energy.[73] Most of the electricity for passenger trains originates from hydropower, which means that the CO_2 emission factor per passenger-kilometer is 90% lower than the average for Europe. The high market share of railway transport is related to the punctuality and service of SBB, the travel card that provides free travel and is used by over 300,000 people, the smart network and timetable with many connections and the efficient links to other modes of public transport: busses, trams, lake ferries and even postal services and cable cars. However, only about 20% of SBB passengers are tourists. So this Phase 4 achievement is not so much an achievement of the Swiss tourism sector, but of the national railway itself. It is a reminder that structural change is feasible if we really want it.

Figure 2: The tourism sector takes action



5. How to move the sector forward

As we have seen, the attempts to deal with overtourism and its effects on the environment and local residents, are in Phases 1 and 2, while issues related to climate change are in many cases entering Phases 3. The main focus should be on getting the market to actually start competing on sustainability. This means the following for the different stakeholders.

5.1 The issue of sustainable tourism and overtourism (Phase 1-2)

Industry

To help avoid overtourism, the tourism industry needs to shift its policies away from the growth paradigm to a much wider sustainable development scope.

Companies can compete on ecotourism, putting sustainable tourism at the core of their business model. This means integrating the existing labels on ecotourism, but also cooperating across the tourism sector: local tour operators should join forces with ecological hotels and transportation companies, as to create a larger and stronger sector of sustainable tourism companies.

On a regional scale, companies together with other stakeholder can organize and support local multi-stakeholder platforms to exchange ideas and collaborate on addressing the local social and ecological impact of (over)tourism. One such example is the annual Sustainable Tourism Asia summit, being held since 2013, in which leading companies, but also governments and NGOs in Asia gather to collectively to make tourism more sustainable.[74]

In summary:

- Develop business models around sustainable tourism
- Enhance cross-sector cooperation between tour operators, hotels, transportation companies and others
- Address local social and ecological impact of (over)tourism in multi-stakeholder platforms

Governments

Governments play a crucial role in the transformation of the tourism sector. It is important that governments have a stronger and clearer vision on how they see the tourism sector develop. What the sustainability challenges are and what is expected from every actor besides just growth and volume. Existing sustainable tourism labels can be more explicitly endorsed by governments and governments can do much more to recognize and reward frontrunning companies in the sustainable tourism sector. Give permits and benefits to hotels, restaurants, tour operators only if they can credibly show that they are implementing best practices to preserve the environment, reduce energy and water use, but also to reduce burdens on local residents and share the (economic) benefits with local residents and communities.

At the same time, governments can start to control and limit the volume of the sharing economy platforms, businesses and other initiatives that may cause overtourism and deregulation. For example, recently, Amsterdam has announced it would ban Airbnb accommodation from the busiest neighborhoods and limit their short-term rentals to a maximum of 30 days. This type of measures is increasingly expanding to other cities as well.[75]

Other measures (national) governments can take to sustainably absorb visitor pressure, include the creation of a clear and realistic vision on transport infrastructure capacities. Airports, cruise harbors, roads and rail lines should be planned and coordinated in such a way, that it matches the capacity of the destination tourist sites and facilities. In other words, in order to combat overtourism, governments should prevent that the number of people that can travel to a city exceeds the number of people that a city can actually absorb.

In summary:

- Reward the more sustainable hotels, sites and activities through subsidies and preferential treatment

- Enforce regulation of platforms and developments that cause overtourism
- Create a sustainable transport infrastructure capacity, in line with the absorption capacity of tourist sites

Civil Society and standard-setters

Considering the phase the Tourism sector is in, it is all about rewarding the front runners and punishing the laggards. Civil society and standard-setters can further build upon the standards already in place for sustainable tourism, such as the EU Eco-label and ETIS, and continue to pressure the earlier mentioned Destination Management Organizations (DMOs), tour operators and other actors in the tourism industry to comply with, and further develop, these acceptable levels and other standards of tourism. These standards could then aide the tourism sector to develop early-warning indicators, enabling these same DMOs to track and respond to overtourism at a much earlier stage.

Moreover, civil society can play a stronger role in promoting more sustainable tourism locations and aide market actors that are trying to compete on more sustainable practices. Besides promotion, it can also help to campaign against notoriously bad and unsustainable tourism locations, companies, bad planning practices from governments and inform tourists that while they enjoy a relaxing holiday, with their presence in these locations or venues they actively contribute to the destruction of the environment.

In summary:

- Build upon standards on sustainable tourism that are already in place
- Pressure tourist companies to comply with sustainable tourism standards
- Promote sustainable tourism locations and campaign against the unsustainable destinations

5.2 The issue of energy consumption and climate change (Phase 3)

To continue to combat climate change, there are still many issues that need to be addressed. Mainly, diversify the modes of transport besides air travel, make air travel cleaner and much more efficient, introduce CO_2 tax and promote short distance travel. Governments, industry and civil society can work together on this mix of interventions.

Industry

Diversify modes of transport – Industry can take up the opportunity to improve and integrate websites for ticketing, timetable and booking sites for both rail, coach and ferry travel besides air travel. Booking an airline ticket is currently much easier than booking a ticket for an international railway journey. For example, all timetable and pricing data could be integrated in a single repository, which has been the case for aviation since the introduction of computers.

Make air travel cleaner - The process of increasing the share of zero-emission e-fuels could be expedited by international tourism organizations like the UNWTO and the WTTC. These organizations could also advocate more effective tax regimes for the various transport modes, particularly for aviation.

For the more distant future, the development of zero-emissions aircraft – most likely based on hydrogen, fuel cells and electric propulsion – needs to commence now. Both existing aviation companies, and start-ups, can play a role in this, where in Phase 0-1, initially the startups took the initiative.

However, the focus of industry need not be to merely engage in disruptive innovation; tour operators and air travel agencies can also further reduce their emissions by making use of tools such as CARMACAL, discussed in Phase 0-1.

Promote short distance travel – Industry can take up its responsibility by refocusing visitor markets away from long-haul aviation-dependent markets to closer destinations served by slower modes of travel. The sector could promote short-haul destinations as high value and promote short-haul trips by raising the prices of long-haul ones in their portfolio. For example, some tour operators offer 'surprise products'; the customer learns the destination only on the day of departure. Creating added value in these innovative ways could enable tour operators to stop competing on distance and thus reduce the overall distance of their surprise portfolio.

In summary:

- Improve and integrate websites for forms of travel besides air travel
- Advocate for more effective tax regimes for alternative transport modes
- Make use of existing tools to reduce emissions
- Engage in disruptive innovation for alternatives modes of (air)travel
- Refocus visitor markets to closer destinations

Governments

Make air travel cleaner - First of all, governments should create a vision for the future of sustainable travel by including aviation in the goals and measures of the Nationally Determined Contributions (from the 2015 Paris Agreement).[76] As agreed in the Paris Agreement, this will be principally the task of the International Civil Aviation Organization (ICAO), which has already agreed upon targets and measures related to CO_2-reduction in its resolutions, most notably its Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).[77] Although these developments may seem positive, the problem is that by having the extremely weak goal to keep emission at the level of 2020 instead of reducing them to zero by 2050, the offsetting will not significantly reduce the emissions."[78]

Diversify modes of transport - Governments can also reduce the relative use of air travel by enhancing the role of other types of transportation, such as railways. An increasing number of countries are investing in high-speed rail, which is an excellent competitor to air travel in the long-haul to medium-haul transport markets. This has been shown in the past 10-20 years in China.[79,80,81] High-speed rail has also worked very well in Europe, with the most recent examples in Spain and Italy. For instance, the total number of rail plus air travelers between Barcelona and Madrid fluctuated around 5 to 6 million between 2003 and 2013. But the opening of the high-speed rail line in 2008 dramatically changed the modal split from 9% rail in 2003 to 60% rail in 2013.[82] Another example is the direct Eurostar connection from London to Amsterdam that was introduced in 2018 with two returns per day, and will be expanded to three returns per day in 2019. This rail link has been successful even though a train change and customs check was still required in Brussels due to stalled government negotiations. Not surprisingly, policy makers in the EU and elsewhere are being urged to invest in a well-functioning high-speed rail network.[83]

At a transnational level, governments such as the EU can make an increasing share of zero-emission e-fuels mandatory. The new promising technologies such as 'power-to-liquids' (PtL) process and the hydrogen-electric planes are still in phase I of its development. To accelerate its implementation it is necessary for governments to integrate this in their vision for a sustainable aviation, help speed up the developments of these new technologies through subsidies, put pressure on companies like Airbus, Boeing and other airplane manufacturers to start piloting this new technology in their airplanes and help support any travel agency or airline company that want to use these new planes.

Promote short-distance travel - Governments can also promote the use of short- and medium distance air travel by increasing the cost of air travel through increasing taxes. This would concern ticket taxes, value-added tax on air travel and/or kerosene (fuel) levies.

Take for example the latter, fuel levies. If such a measure would be in place, the actors that emit GHGs through aviation fuel do feel the consequences directly in their wallets. Negative environmental effects that are usually externalized, now suddenly become part of the cost-structure of these aviation companies. As a result, shorter distances become relatively more profitable than large-distance travels as less fuel is used, and less tax is paid. Furthermore, such an aviation fuel tax would level the playing field towards cleaner alternatives for transport such as railways, which now become relatively cheaper compared to air transportation.

This is however something that cannot be done by national governments alone, but needs to be enforced by international legislation. As there is fierce competition in the airline industry, increasing taxes in one country will make it more difficult for these airlines to remain competitive; creating a level playing field through international agreements is therefore needed. In fact, in the European Union, one of the few regions where airline travel is almost completely exempt from any taxes, there are debates going on regarding the adoption of an EU-wide airline tax.[84,85]

In summary:

- Create a future-proof vision for sustainable travel by including air travel in the NDCs
- Make zero-emission fuels mandatory in aviation
- Help speed up development of new technologies such as PtLs
- Increase short-distance travel through tax incentives

Civil society and standard-setters

Diversify modes of transport –NGOs can play a more forceful role in campaigning and calling for more investments in other means of transport, such as railways and ferries. They could also set up and participate in platforms that bring together more sustainable transportation companies.

Make air travel cleaner – NGOs can play the watchdog through campaigning against those travel agencies, airline companies, that are not acting sustainable, while also enhancing transparency on these transport methods towards consumers and governments.

They can also influence governments by urging to introduce fiscal measures that make the use of carbon-emitting fuels more expensive, stricter fuel efficiency standards and measures to incentivize aircraft constructors to speed-up the renewal of the aircraft types they produce.[86] A prominent example is the efforts of NGO Transport and Environment, which has continuously criticized the EU for being a 'kerosene tax haven'.[87] This criticism is not limited to blaming and shaming; as part of their campaigns, Transport and Environment also publishes reports on the use of alternative fuels for the aviation industry, such as e-fuels. One of these reports shows detailed analyses on the benefits and implementation of e-fuels, thereby advising governments on its possible implementation.[88]

Promote short distance travel **–** When it comes to promoting short distance travel, NGOs should promote first movers in both the aviation industry and in other types of transport, that offer short-distance initiatives. For example, at the time of writing (October, 2019), travel organization TUI announced it would no longer offer flights between the Netherlands and Paris. Rather, the company promotes train travelling to these destinations, as 'for these distances [it] is a cleaner alternative', TUI said.[89] NGOs should pick up on these initiatives and use it as an example for other companies to act accordingly.

In focusing on consumer behavior, NGOs can also pick up on the 'flight shame' movement, a loosely organized bottom-up campaign that has recently gained momentum. The movement plays on

people's individual sense of responsibility, by pointing out the detrimental effects of flying and showing the upsides of alternatives modes of transportation.[90] In addition to focusing on large-scale changes in governmental and industrial policies, NGOs should not forget to pressure and reward the individual consumer as well.

In summary:

- Campaign for alternative means of transport
- Lobby for tax increases in high-emission modes of travel
- Create transparency and scenarios about the desired future
- Promote short-distance travel by rewarding frontrunners and changing consumer norms

6. Executive summary

Tourism has a long history, and can be traced back as far as the Roman empire, when elite members of society were known to travel for pleasure. In the 20th century, the way we travel and used transportation changed dramatically, and tourism experienced enormous growth. The worldwide increase in tourism was the result of a growing world population, rising GDP per capita, and improved income equity.

The economic importance of the tourism industry is significant. The industry grew from just over 600 million tourists per year in 1900 to over four billion in 2000, equivalent to continuous growth of 1.9% per year. Today, the tourism industry reports about five billion arrivals per year of tourists who travel domestically (within their own country), compared to over one billion international tourist arrivals. The most common mode of transport overall is the automobile, which is used in 48% of all trips. Travel by airplane accounts for 22% for combined domestic and international tourist arrivals. The fast growth of cheap air travel worldwide was facilitated by deregulation of the international markets and 'open skies' agreements, which allow unrestricted landing rights between countries. In 2016, the tourism and travel industry directly generated $2.3 trillion in revenue and provided 109 million jobs worldwide. This represents 3.1% of global GDP and about 3.6% of global employment. When indirect and induced financial impacts are taken into account, the tourism and travel sector was responsible for 10.2% of world gross domestic product (GDP) in 2016, and provided approximately 10% of all jobs worldwide

Besides the contribution of the tourism sector to economic development and employment, the sector is known for its severe sustainability challenges.

There are five different categories of environmental impacts of global tourism:

- changes in land cover and land use,
- energy use and climate change,
- biotic exchange and extinction of wild species,
- exchange and dispersion of diseases, and changes in the perception and understanding of the environment.

This chapter has focused on energy use and climate change and on the environmental and social effects of a relatively new phenomenon called 'overtourism'. Tourism is directly responsible for 5% of global CO_2 emissions and 8% if indirect and supply-chain emissions are included. Air transport is currently responsible for over half of CO_2 emissions in the tourism and travel industry, and this share will likely increase to 75-80% by the end of the century. The success of tourism in some locations appears to become its own enemy with called 'overtourism'. Overtourism is defined as "the situation in which the impact of tourism, at certain times and in certain locations, exceeds physical, ecological,

social, economic, psychological, and/or political capacity thresholds". Currently there is a list of over 100 destinations worldwide that are severely affected by overtourism.

The most important causes of overtourism are the falling costs of air transport, and the rise of sharing economy platforms (like Airbnb) and review sites (like TripAdvisor, or even Instagram) which spread the word fast and attract others to come to the exact same location and tend to concentrate tourists at a small number of popular destinations.

The reason why the tourism sector is so unsustainable can be explained using the four system loops.

Loop I: Market dynamics. In the tourism industry, most actors compete on the short-term gains and on low costs. Every season, the hotel rooms, the restaurants, the beds, the trips need to be booked full or it is a loss for ever. Moreover, consumers are now able to track and compare prices across multiple platforms and ratings of services to find the cheapest flight and hotel available. Furthermore, global competition puts further downward pressure on prices, which pushes volumes even higher. all stakeholders are now faced with very low margins and must compete in a mass market where quantity and standardized offering often has priority over quality and certainly of sustainability

Loop II: The Enabling environment. Tourism means more business, foreign currencies and employment. This in turn means more tax income and more economic development. For most governments it is vital that they ensure that their national tourism sector remains competitive with many other destinations, even though the destinations are increasingly converging in terms of 'pulls' to engage tourists. This leads to a growth paradigm where the sector must grow every year and it usually focuses on volume, meaning arrivals and guest-nights, assuming fixed (low) prices and much less on protecting the environment and reducing overtourism. This growth paradigm further drives the externalization of sustainability costs.

Loop III: Mismatch benefits and effects. The actors driving the tourism sector, such as travel agencies, government agencies and the aviation industry, but also local hotels and restaurants, all benefit from an ever-expanding growth and volume of the sector. More tourists mean more profits. The effects their activities have on the environment and local residents are often not felt by them, until it is too late. Furthermore, costs are easily externalized as even the governments who in general are responsible for protecting the public good also have a short term and growth mindset.

Loop IV: Lack of alternatives. When looking at the conditions to change, we can identify several obstacles to a greener tourism industry. First, for longer distances, there are simply not many alternatives for airplanes. Subsidies on fossil fuels also continue to favor the kerosene airplanes. Greening air travel is complex because of the 'system inertia' of the aviation sector meaning that the global aircraft fleet will continue to use kerosene as a fuel until late in the 21st century. Generally, however, governments appear to be unwilling to regulate excessive growth as the growth paradigm is still, unfortunately and incorrectly, still widespread.

Despite the systemic forces that are set for an unsustainable outcome there are many initiatives and interventions happening in the sector that can help transform it to a more sustainable future. In a growing number of tourism destinations, residents and local governments are increasingly experiencing the negative backlash to several issues associated with overtourism, or related issues such as pollution, that are eroding the attractiveness of their destination. As a result, several initiatives have popped up that aim to address these issues

Phase 1: Inception. At individual destinations there are numerous projects to help protect the tourist sites and attractions, clean the beaches, or eat and shop from local residents shops. These are typical phase I initiatives.

At a global level, things are happening too. To focus attention and resources from the various stakeholders involved on issues around tourism, the United Nations named 2017 as the year of Sustainable Tourism and Development. In the same year, various campaigns also launched. As these campaigns and declarations are there to give urgency to the issue it can be considered a Phase I activity.

Carbon offsetting schemes and projects can also be seen as typical Phase I type of interventions. Several technical solutions to measure or reduce CO_2 emissions and footprint or alternative for sustainable air traveling.

Phase 2: Competitive Advantage In some parts of the sector, there is now some competition on sustainability in the form of sustainability certifications for hotels and restaurants. Governmental stakeholders have also taken up certification of tourism sites These operators then use this accreditation in their branding and marketing strategies. but none of these standards has reached significant uptake in the market. They remain a local or niche phenomenon. Certification systems lack systematic evaluation, and the progress of certified products is often not monitored due to cost restraints. Finally, many studies have shown that the sustainable tourist – the consumer who conscientiously seeks sustainable modes of travel – is almost non-existent. For the overwhelming majority of the tourists, climate change awareness does not appear to influence their travel-related decisions. The many ecolabel schemes that have been implemented in tourism are therefore not very effective. Overall, it is a concern that the tourism sector is not sufficiently competing on sustainability yet. This is a sign of immaturity and lack of urgency in the sector. Without proper competition between travel agencies, hotel chains, locations and so forth, the market dynamic loop will not change, and without it, it will be very hard to make a transformational change.

Phase 3: Pre-competitive collaboration. There are several Phase III, pre-competitive efforts focused on sustainable tourism, addressing both overtourism and environmental problems. These consist chiefly of platforms, partnerships, councils and associations. However, their impact is currently underwhelming as none of these platforms has significantly reduced greenhouse gasses or avoided overtourism. As long as the market has no incentive to change these platforms will play lip service to the transformation at best.

Phase 4: Institutionalization. There are not really examples of interventions that are in a phase IV, though for instance the Swiss Railways – and others are now following – do already provide zero-emission transport.

When it comes to dealing with overtourism and its effects on the environment and local residents the sector seems to still be in Phases 1, early phase 2. In order to advance the sector stakeholders can focus on the following actions.

Companies should start to compete on sustainable tourism, putting sustainable tourism at the core of their business model. This means integrating the existing labels on ecotourism, but also cooperating across the tourism sector. On a regional scale, companies together with other stakeholder can

organize and support local multi-stakeholder platforms to exchange ideas and collaborate on addressing the local social and ecological impact of (over)tourism.

Governments play a crucial role in the transformation of the tourism sector. Even though the sector may be global, the tourist sites are all managed nationally or locally. It is important that governments have a stronger and clearer vision on how they see their sector develop. What the sustainability challenges are and what is expected from every actor besides just growth and volume. Give competitive advantage to hotels and operators if they show credible progress. At the same time, governments can start to control and limit the volume of the sharing economy platforms, businesses and other initiatives that may cause overtourism and deregulation. Limit daily capacity of tourists to what the location can handle.
Civil Society and standard-setters can help get the sector to move forward. Considering the phase the Tourism sector is in, it is all about rewarding the front runners and punishing the laggards. Civil society and standard-setters can further build upon the standards already in place for sustainable tourism civil society can play a stronger role in promoting more sustainable tourism locations and aide market actors that are trying to compete on more sustainable practices. Besides promotion, it can also help to campaign against notoriously bad and unsustainable tourism locations.

If the different stakeholders can get the market to embrace sustainability by creating competitive advantages in combination with clearer guidance and force from the governments, the tourism sector can start to move beyond phase 2 of market transformation and start to collaborate between the different stakeholders to start to make the tourism sector future proof again. Currently the sector seems to still be in denial for the issues it is surely coming its way.

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