HANNAH CAROLIN FRANZ (ID 73687)

DEVELOPMENT OF A MATURITY ASSESSMENT MODEL FOR SUSTAINABLE TOURISM

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DEVELOPMENT OF A MATURITY ASSESSMENT MODEL FOR SUSTAINABLE TOURISM

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DEVELOPMENT OF A MATURITY ASSESSMENT MODEL FOR SUSTAINABLE TOURISM

Work Authorship Declaration

I declare to be the author of this work, which is unique and unprecedented. Authors and works consulted are properly cited in the text and are included in the listing of references.

Hannah Carolin Franz

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SUMMARY

(Abstract)

Sustainability has become one of the most pressing concerns for the tourism sector worldwide. Destination managers are called to develop strategies and actions to follow, measure and monitor their success in following a sustainable path of development. However, the vagueness of the concept of sustainability, the complexity of existing measurement frameworks and insufficient inclusion of relevant concepts, such as digitalization, pose a challenge for tourism practitioners to operationalize appropriate the measures.

Following a design science research approach, this dissertation aims to develop a conceptual solution for the assessment of sustainability in tourism destinations and the provision of directions for destinations' future priorities and fields of action. Objectives for this conceptual solution are developed based on a critical review of relevant literature and existing assessment models for sustainable tourism. Through a synthesis of sustainability dimensions and sub-domains, these objectives are operationalized by the development of a maturity assessment model for sustainable tourism. This model is then validated by means of semi-structured interviews with tourism experts and stakeholders and implications for the model implementation are outlined.

The dissertation ends with a view on limitations and directions for further research as well as implications for policy-making and tourism authorities.

Keywords: Maturity model, Sustainable tourism, Assessment, Destination management, Digitalization, Design science research

RESUMO

A sustentabilidade tornou-se uma das preocupações mais prementes para o setor do turismo em todo o mundo. Os gestores de destinos turísticos são chamados a desenvolver estratégias e ações específicas capazes de medir e monitorizar o seu sucesso na construção de um desenvolvimento sustentável. No entanto, a imprecisão do conceito de sustentabilidade, a complexidade dos modelos de mensuração existentes e a inclusão insuficiente de conceitos relevantes, como a digitalização, representam um desafio para os profissionais do turismo operacionalizarem estratégias adequadas.

Seguindo uma abordagem de investigação baseada em *design science* (*design science research*), esta dissertação visa desenvolver uma solução conceptual para a avaliação da sustentabilidade em destinos turísticos e fornecer orientações para futuras prioridades e campos de ação dos destinos turísticos. Os objetivos para esta solução conptual são desenvolvidos com base numa revisão crítica da literatura relevante e dos modelos de avaliação existentes para o turismo sustentável. Através de uma síntese das dimensões e subdomínios da sustentabilidade, estes objetivos são operacionalizados pelo desenvolvimento de um modelo de maturidade para o turismo sustentável. Este modelo é então validado através de entrevistas semi-estruturadas com especialistas e *stakeholders* do setor do turismo, para delinear as implicações para a implementação do modelo.

A dissertação termina com uma reflexão sobre as limitações e orientações para investigação futura, bem como as implicações para a formulação de políticas públicas e recomendações para as autoridades de turismo.

Palavras-chave: Modelo de maturidade, Turismo sustentável, Avaliação, Gestão de destinos turísticos, Digitalização, *Design science research*

RESUMO ALARGADO

Nas últimas décadas, antes da pandemia da Doença Covid-19, o turismo tornou-se um dos setores económicos de maior e mais rápido crescimento em todo o mundo, contribuindo com cerca de 10% do PIB a nível global. Tanto para as economias em desenvolvimento como para as avançadas, o turismo pode desempenhar um papel importante na diversificação das exportações, reduzindo os défices comerciais e compensando as receitas de exportação menos relevantes de outros bens e serviços. No entanto, especialmente para muitos países em desenvolvimento, o turismo representa uma importante fonte de receita e pode representar até 90% das exportações totais de um país. Esta situação evidencia a crescente importância da atividade turística nos países em desenvolvimento como veículo para o financiamento de bens de capital e importação de matérias-primas necessárias para o desenvolvimento e diversificação económicos. Além disso, a atividade turística cria oportunidades de emprego, especialmente para mulheres e jovens, gerando empregos diretos e indiretos que representam 1 em cada 10 empregos no mundo.

Apesar do considerável potencial de desenvolvimento regional, algumas economias não conseguiram aproveitar plenamente o crescimento do turismo internacional, enquanto outras começaram a experimentar efeitos negativos nas comunidades locais, não só no que se refere ao meio ambiente, mas também no que se refere a perdas de participação no mercado, falta de capacidade de controlar o aumento dos preços nas comunidades locais e as fugas de receitas do turismo par regiões terceiras, entre outros. Deste modo, o desenvolvimento do turismo sustentável tem sido amplamente reconhecido como um veículo para combater os efeitos acima mencionados e permitir uma viabilidade e competitividade a longo prazo dos destinos, que precisam de desenvolver políticas e estratégias para equilibrar a exploração dos recursos (naturais, sociais, culturais e económicos) e construir alternativas para a proteção do território e do bem-estar das comunidades locais. Assim, existe atualmente uma necessidade identificada de criar ferramentas e abordagens que permitam a monitorização constante do destino e que ofereçam soluções ou acções concretas para corrigir efeitos indesejados. Trata-se de construir um modelo de referência imprescindível para apoiar a tomada de decisão e para orientar a direção do desenvolvimento.

Nas últimas duas décadas, foram feitos avanços notáveis no desenho de ferramentas e estruturas operacionais para avaliar o turismo, no entanto, apesar desses avanços, atualmente não há acordo sobre uma lista universal de indicadores, o que permitiria uma comparação dos níveis de sustentabilidade em diferentes destinos turísticos. Esta situação decorre da falta de consenso sobre uma única definição de sustentabilidade no turismo, ou sobre quais as dimensões incluir nesta noção, bem como da dificuldade de agregar uma considerável quantidade de informações necessárias para um modelo de avaliação que tem de ser abrangente.

Embora a digitalização tenha começado a transformar rapidamente a indústria do turismo, mesmo antes da pandemia de Covid-19, os modelos de indicadores existentes para o turismo sustentável incluem muito poucas referências ao potencial que a tecnologia inteligente pode ter para impulsionar a sustentabilidade. Para colmatar esta lacuna de investigação identificada, o objetivo desta dissertação é desenvolver uma solução na forma de um modelo de maturidade abrangente e atualizado para o desenvolvimento sustentável do turismo, que considere, igualmente, os potenciais da digitalização.

Seguindo uma abordagem de investigação baseada em *design science*, os objetivos para esta solução conceptual são desenvolvidos com base numa revisão crítica da literatura relevante e dos modelos de avaliação existentes para o turismo sustentável. Através de uma síntese das dimensões e das subdimensões da sustentabilidade, este objetivo éoperacionalizado através do desenvolvimento de um modelo de maturidade para o turismo sustentável. O modelo proposto é validado através de entrevistas semi-estruturadas com especialistas e *stakeholders* do setor do turismo, para delinear as implicações para a implementação do modelo.

A dissertação termina com uma reflexão sobre as limitações e orientações para investigações futuras, bem como as implicações para a formulação de políticas públicas e recomendações para autoridades de turismo. Assim, este estudo visa contribuir para o corpo de literatura existente sobre a mensuração do turismo sustentável e incitar investigações adicionais e extensas sobre modelos de maturidade para destinos turísticos sustentáveis. Além disso, a dissertação visa oferecer novas informações aos *stakeholders* do turismo que procuram abordar a preocupação com a sustentabilidade nos destinos que gerem e fornecer uma estrutura operacional aos profissionais do setor para a avaliação do

estado atual dos destinos em que operam e, finalmente, o desenvolvimento de uma visão, prioridades e linhas de ação para um futuro mais sustentável.

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Abbreviations List

CMM ..... Capability Maturity Model

COVID-19 ..... Coronavirus Disease 2019

DMO ..... Destination Management Organization

DSR ..... Design Science Research

EC ..... European Commission

ETIS ..... European Tourism Indicators System

GDP ..... Gross Domestic Product

GDSI ..... Global Destination Sustainability Index

GDSM ..... Global Destination Sustainability Movement

GSTC ..... Global Sustainable Tourism Council

ICT ..... Information and Communications Technology

IS ..... Information Systems

MM ..... Maturity Model

PIB ..... Produto Interno Bruto

SDGs ..... Sustainable Development Goals

SDRV ..... Smart Destinations of the Region of Valencia

ST ..... Smart Tourism Destinations

UNEP ..... United Nations Environment Programme

UNWTO ..... United Nations World Tourism Organization

USD ..... United States Dollar

WEF ..... World Economic Forum

1 INTRODUCTION

Tourism is a multi-faceted industry that spans across a wide range of stakeholders and, this way, has impacts on the entire economy, society and environment of a destination. Due to its specific nature, tourism holds great potential for regional development, but also major risks if growth and development are not managed properly. Destinations around the world therefore need to implement strategies and build capabilities to drive sustainable tourism development. Current models try to assess the sustainability of tourism destinations but fail to provide the needed clarity and completeness for true practical relevance. This dissertation aims to provide substance to the task of measuring sustainable tourism by developing a comprehensive and up-to-date maturity assessment model for tourism destinations. The model is be based on a best-of-breed of current sustainability concepts in tourism while also exploring the integration of smart technologies. Its purpose is to support practitioners in the tourism field in assessing the current state of a destination and developing relevant actions for a more sustainable future.

1.1 Definition and Relevance of Theme

Over the past decades prior to the Coronavirus Disease 2019 (Covid-19) pandemic, tourism has become one of the largest and fastest-growing sectors worldwide (United Nations World Tourism Organization (UNWTO, 2021). With an increase of 6% compared to the prior year, 2019 had marked the tenth consecutive year of growth in international tourism (UNWTO, 2021). According to Statista (2022), travel and tourism accounted for 6.1% of the GDP globally, generating roughly 5.8 trillion USD in 2021, while figures prior to the pandemic even reached over a 10% share. While the contribution to GDP can range from around 2% for advanced, diversified economies where tourism is a comparatively small sector, this share can go up to or exceed 10% for countries that have tourism as an important pillar of their economy (Cernat and Gourdon, 2012). Tourism exports also accounted for 28% of the world's total services outputs in 2019, which makes it the world's third largest export category after fuels and chemicals, and ahead of automotive products and food (UNWTO, 2021). As the United Nations World Tourism Organization (UNWTO) notes further, tourism can play an important role for export diversification both for emerging and advanced economies, both through the reduction of trade deficits and the compensation for weaker export revenues from other

goods and services. For many developing countries, tourism, in this way, is a major source of foreign exchange income and can represent up to 90% of the country's total exports (UNWTO, 2021). This highlights the growing importance of tourism activity in developing countries as it allows them to finance the import of capital goods and raw materials, which are required for the economic development and diversification of their economies (Cernat and Gourdon, 2012). In addition, tourism activity creates opportunities for employment, especially for women and young people, who tend to be employed in the large share (around 80%) of micro, small and medium-sized enterprises within the tourism sector (UNWTO, 2021). As the UNWTO (2017) states, tourism, thereby generates direct and indirect employment that accounts for 1 in 10 jobs worldwide. Aside from these figures, it needs to be noted that, unlike many primary products with a potential decreasing share in world consumption, tourism is characterized by a favourable income elasticity of demand (meaning that with increasing incomes, tourist expenditures increase at an even faster rate) and, despite having experienced several crises, a lower revenue volatility than other primary commodities (Cernat and Gourdon, 2012).

However, despite the considerable potential for regional development, some economies have not been able to fully take advantage of the growth in international tourism while others have started to experience negative effects on host communities, the environment, as well as the appeal of destinations from unsustainable growth (Cernat and Gourdon, 2012, Torres-Delgado and Saarinen, 2014). Loss of market share, capacity shortages or price increases for the local communities and leakages of tourism revenues are only some examples of the potential negative results, if tourism development is not managed properly (Kim et al., 2013; Koens et al. 2018). Sustainable tourism development has therefore been widely acknowledged as vehicle to counter the above-mentioned effects and to enable a long-term viability and competitiveness of destinations (Bramwell and Lane, 1993; Liu, 2003). Destinations need to develop policies and strategies to balance the exploitation of (natural) resources and build hypotheses for the protection of the territory and well-being of the local communities (Marinello et al., 2023). Based on these, as Marinello and colleagues (2023) argue, tools and approaches need to be designed to enable a constant monitoring of the destination and timely initiation of corrective actions, if needed. Ko (2005) add to this *"If sustainable development is one of the tourism industry's major contemporary objectives, then the industry needs to be able to measure*

its performance and impacts in this area." (p.432). Destinations therefore need to be able to assess both their actual and potential level of sustainability in order to identify existing gaps. In addition, they need benchmarks as basis for their decision-making and orientation for their own development (Cernat and Gourdon, 2012).

In the past two decades, notable advances have been made in the design of operational tools and frameworks to assess tourism sustainability (Lu and Nepal, 2009; Schianetz et al., 2007). However, despite these advances, currently there is no agreement on a universal list of indicators, which would enable a comparison of sustainability levels in different tourism destinations (Agyeiwaah et al., 2017; Punzo et al., 2022). This is partly due to the fact that up to this day, there is no consensus for a single definition of sustainability in tourism, or for which elements to include in it (Buckley, 2012), as well as the difficulty to aggregate the considerable amount of information required for a comprehensive assessment model (Cernat and Gourdon, 2012). While digitalization has started to rapidly transform the tourism industry, even before the Covid-19 pandemic (Buhalis and Law, 2008), existing indicator models for sustainable tourism only include very little reference to the potentials that smart technology holds to drive sustainability (Ivars-Baidal et al., 2021b; Shafiee et al., 2019).

To close this research gap, the objective of this dissertation is to develop a solution in the form of a comprehensive and up-to-date maturity assessment model for sustainable tourism development, which accounts for the potentials of digitalization. With this, this dissertation aims to contribute to the existing body of literature regarding the measurement of sustainable tourism and to initiate further and extensive research on maturity assessment models for sustainable tourism destinations. In addition, the dissertation aims to offer new information to tourism stakeholders who are seeking to address sustainability concern in their destination and to provide an operational framework to practitioners for the assessment of the current state of their destinations and the development of a vision, priorities and courses for action towards a more sustainable future.

1.2 Organization of Study and Summary of Following Chapters

This dissertation document is organized as follows. In Chapter 2, a literature review about the main underlying concepts of sustainable tourism destination and the measurement of sustainable tourism is conducted. In addition, the theoretical basis for the

subsequent design of the model is established through a closer review of existing assessment models for sustainable tourism, the relevance of digitalization aspects and the potential use of maturity models for sustainable tourism assessment. In Chapter 3, the methodological concepts underlying this dissertation will be explained in detail. Chapter 4 presents the designed maturity assessment model for sustainable tourism along with indications on the proposed implementation process and implications for its use. In Chapter 5, the proposed model will be validated through interviews experts and key stakeholder in the tourism field. Chapter 6 concludes the thesis with a discussion of potential limitation of the model, notes for future research as well as policy recommendations and implications for tourism agencies.

2 LITERATURE REVIEW

In this chapter a literature review provides the theoretical context on the research topic. As the emphasis of this dissertation paper is on developing a maturity assessment model for sustainable tourism, the objective of this chapter is to present an overview of theory and studies related to sustainable tourism, sustainable tourism destination and the measurement and monitoring of sustainable tourism. A subsequent section provides a more in-depth view on gaps and potentials for measuring tourism sustainability by reviewing existing assessment models for sustainable tourism and investigating the relevance of digitalization aspects for sustainable tourism assessment and the potentials of using maturity models to measure sustainable tourism.

2.1 Sustainable Tourism and Sustainable Tourism Destinations

In the following sections, an overview of the theoretical basis of sustainable tourism and sustainable tourism destination is established. This is done by first reviewing the concept and historical roots of sustainable development and outlining its implications for tourism destinations in the present day. In the second subsection, the different dimensions of sustainability for tourism destinations are outline in more detail to complete the conceptual scope of the targeted maturity assessment model.

2.1.1 From Sustainable Development to Sustainable Tourism Destinations

The notion of sustainability is not a new one and has been discussed with varying intensity since the 1970s (Butler, 1999). As Butler notes, the concept *"sustainable development"* as laid out in the so-called Brundtland Report (*"Our Common Future"*, United Nations World Commission on Environment and Development, 1987), has, despite the document itself not referencing to tourism, been integral for the resulting discussions on sustainable tourism. In its core, sustainable development is based on the awareness that our natural environment poses limits to growth and that exceeding these limits may ultimately lead to societal collapse (Meadows et al., 1974), which is in line with a general increase in environmental awareness in the 1960s and 1970s (Bramwell & Lane, 1993; Dovers & Handmer, 1993; Wilbanks, 1994). It can be seen, however, that the concept has originated many years prior in the three forms of a conservation vision, a community vision, and in the form of economic theory (Hardy et al., 2002). As Postma et al. (2017) note, it has been recognized that while solving the environmental problem,

sustainable development cannot be achieved without addressing social issues such as reduction of poverty and development of capabilities. This follows the corporate philosophy and accounting form of the triple bottom line (profit, people and planet) as proposed by Elkington (1997). Since the pivotal Brundtland Report, public institutions have taken a focus on sustainable development, especially within the United Nations Conference on the Environment held in Rio de Janeiro in 1992 and the subsequent development of the eight Millennium Development Goals (2000) as well as the 2030 Agenda for Sustainable Development (United Nations, 2015). The United Nations annually report on the progress of the Millennium Development Goals. Their 2022 report displays, however, how societal and environmental issues have only been exacerbated by the Covid-19 pandemic as well as the war in Ukraine, so that action is needed more urgently than ever to even closely reach the goals set for the timeframe of 2030 (United Nations, 2022).

It shows that sustainability is a crucial topic for the contemporary world as such, however, as Postma et al. (2017) note, it holds specific importance for particular industries, such as tourism. As already outlined in the introduction, tourism has the potential to bring positive change to a destination, as is shown by the works of many different researchers (e.g., Buckley, 2012; Hunter and Shaw, 2007; Lee and Jan, 2019; Mathieson and Wall, 1982; Miller et al., 2010; Su and Swanson, 2017). Nonetheless, as Qiu and colleagues (2019: 229) note, tourism might also create "*static and perverse effects*". In today's society, tourism is very much interconnected with external economic, social, ecological, demographic, technological, political and institutional developments (Postma et al., 2017). Because of that, the sector is often found sensitive to actual or perceived changes in the external environment and thus might present an unstable source of income (Giannoni & Maupertuis, 2007). In addition, a too narrow focus on short-term economic gains, overdevelopment and excessive use can threaten the longevity of tourism destinations (Burak et al., 2004). Despite the employment tourism creates, the resulting jobs are often low paid, with high turnover rates and seasonal fluctuation. (Lacher and Oh, 2012). Ensuring that tourism decreases its negative effects and instead creates positive impact on its environmental and social-economic dimensions is what the United Nations World Tourism Organization summarize in their classical and widely recognized definition of sustainable tourism as "*tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the*

industry, the environment and host communities" (United Nations Environment Programme (UNEP) and UNWTO, 2005: 12).

What makes sustainable tourism development additionally complex, is the nature of the industry. It consists of several interconnected domains (e.g. hospitality, sports, recreation, culture and arts, events) that are interdependent but also each have their own dynamics (Cooper and Hall, 2013). Moreover, tourism services and facilities are generally owned, managed or in other ways influenced by a diverse set of actors/agents: public, semi-public and private parties with their own perspectives (Postma and Jenkins, 1997). Due to this complex and interconnected structure of tourism, Schianetz et al. (2007) argue that the destination or regional level holds special significance for the implementation of triple bottom line sustainability. Private organisations and enterprises alone do not have the power to solve important sustainability issues if other local or regional authorities and stakeholders do not play their part. As Schianetz et al. (2007) argue, "*Even if, for example, all hotels in a region minimise their waste generation and dispose of remaining wastes 'properly', it does not necessarily ensure sustainable waste management at the destination"* (p.370). Koeman et al. (2002) therefore suggest that tourism destinations (as defined by the UNTWO[1]) are the appropriate scale to consider sustainable tourism management, planning and development. Only through a combination of stakeholder collaboration, development of sustainable tourism policies and guidelines, responsible business practices and community engagement initiatives can a destination be effectively managed and sustainability targets be achieved (UNWTO, 2019).

2.1.2 The Dimensions of Sustainable Tourism

When reviewing academic literature on sustainable tourism, it can be seen that the environmental, socio-cultural and economic dimension are widely referenced by researcher and institutions to this day (e.g. Blancas et al., 2010, 2018; Farrell and Twining-Ward, 2004; Postma et al., 2017; UNEP and UNWTO, 2005), while some have made minor adjustments or additions in their works. Coccossis (as cited in Butler, 1999),

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[1]UNWTO's working group on destination management defines tourism destinations as "[…] *physical space in which a visitor spends at least one overnight. It includes tourism products such as support services and attractions, and tourism resources within one day's return travel time. It has physical and administrative boundaries defining its management, and images and perceptions defining its market competitiveness. Local destinations incorporate various stakeholders often including a host community and can nest and network to form larger destinations.*" (UNWTO, 2004: 8)

for example, adds the viewpoint of competitiveness of destinations to the interpretation of tourism in the context of sustainable development. As a relatively new concept within tourism research, some authors assess how the dimension of governance impacts the success of sustainable tourism development (Asmelash and Kumar, 2019; Hartman, 2016; Wray, 2015). Marinello et al. (2023) combine this aspect together with managerial and infrastructure sustainability into what they call a *"peripheral"* dimension of sustainability next to the environmental, economic and social aspects. Bramwell et al. (1996 as cited in Butler, 1999), on the other hand, sort the diverse viewpoints into seven dimensions of sustainability: environmental, cultural, political, economic, social, managerial and governmental. Choi and Sirakaya (2006), finally, extend the relevant dimensions for sustainable tourism development by adding a technological scope and highlighting how the appropriate use of information technology can minimize negative effects and bring benefits to a host community.

In the following, the environmental, socio-cultural, economical and destination management dimension of sustainable tourism are reviewed in detail.

Environmental Sustainability of Tourism

As Marinello et al. (2023) found, environmental sustainability is the one dimension that is common in all scientific papers that deal with the sustainable tourism concept and its evaluation and monitoring by means of indicators. Environmental sustainability is hereby mostly understood in relation to the *"conservation and preservation of the natural and built environment in a way that its health and integrity is maintained for the future well-being of the destination"* (Roberts and Tribe, 2008:584). It includes actions to minimize pollution of land, air and water while also manage the consumption of water and energy, and to conserve biological diversity and national heritage (Marinello et al., 2023; UNEP and UNWTO, 2005). What is important to note, is that *"environmentally appropriate"* forms of tourism are often assumed to be small-scale developments such as ecotourism, agri-tourism or rural tourism destinations. As several authors point out, however, this philosophy can, in absence of proper regulatory measures and performance indicators, lead to a growing number of ill-managed developments in the wrong locations that, in the end, can be as harmful and environmentally unsustainable as one single large development (Roberts and Tribe, 2008). This is exacerbated by the fact that tour companies' marketing activities drive an

increasingly high demand for ecotourism products in remote and pristine areas, which are already more fragile and sensitive to human impact and most vulnerable to disruption of culture and degradation of the environment (Liu, 2003). As a consequence, researchers stress that the focus should not be laid on developing new small-scale tourism in undamaged areas, but to repair the damage already done (Butler, 1999). More fundamentally, as Liu (2003) adds, the aim should be to develop conventional mass tourism in an environmentally sustainable matter, and to use different sorts of alternative tourism as supplements where and when appropriate.

Economic Sustainability of Tourism

While the economic dimension is highlighted in various studies, there seems to remain insufficient agreement on the conditions that are required to achieve a position of sustainability in these terms (Qiu et al., 2019). What results from the existing definitions is what the authors describe as a *"multidimensional construct of comprehensive meaning."* (p.228). For the UNWTO (2004), economic sustainability aims to ensure long-term, viable economic operations, a fair and equal distribution of benefits to all stakeholders, employment and income-earning opportunities as well as social services for host communities and to contribute to poverty alleviation. In the UNEP and UNWTO Guidebook (2005), this definition is expanded to generating economic prosperity at different societal levels, cost-effectiveness and vitality of tourism enterprises and activities. Choi and Sirakaya (2006:1276) define economic sustainability as a process that optimizes the rate of growth at a *"manageable level"* under full consideration of the limits imposed by the destination environment. Roberts and Tribe (2008) focus economic sustainability on businesses' ability to make profits and hence benefit the local and national economy. As a result, the authors highlight business profitability, internal financial stability, foreign exchange leakages, domestic sectoral linkages and employment as relevant indicators for economic sustainability.

Socio-Cultural Sustainability of Tourism

The socio-cultural dimension of sustainability is traditionally defined by respect for the authenticity of host communities, a conservation of their built and living cultural heritage as well as traditional values and a contribution to tolerance and inter-cultural understanding (UNWTO, 2004). It emphasizes the respect for human rights and equal

opportunities for all, maintaining and developing local life support systems and avoidance of any form of exploitation (UNEP and UNWTO, 2005). Choi and Sirakaya (2006) further highlight respect for local social identity and social capital, and the strengthening of social cohesiveness and pride, which is elementary to allow residents of the local community to control their own lives. In an earlier work, the authors emphasize that *"residents are major actors in the tourism development process since they are directly affected by it"* (Choi and Sirakaya, 2005:380) and that, consequently, residents' perceptions towards visitors and tourism development overall play an important role for the attraction and satisfaction of visitors. Whereas economic indicators may be relatively easy to monitor based on available information and data, as White et al. (2006) note, the socio-cultural dimension of sustainability can prove difficult to quantify and therefore relies solely on *"subjective data"* that has a better relationship with our values, feelings and perceptions. Roberts and Tribe (2008) put forward that culture is continuously evolving, with the effect that meanings that have been attributed to specific traditional activities may be replaced over time, making sustainably a difficult concept to apply to cultures. Liu (2003) picks up on this phenomenon and argues that socio-cultural sustainability should not solely be understood in preservationist terms, but account for the benefits of social change, the promotion of modern values, social progress and cultural evolution that can be brought along by tourism. The author notes further, how development of host communities in terms of economic and social progress can be stimulated by a *"demonstration effect"* (p.467) in face-to-face contact with tourists, introducing new ideas, values and lifestyles.

Sustainable Destination Management

As describer earlier, the tourism sector is a complex system that includes a large range of stakeholders in the destination. In the words of Pike and Page (2014:3): *"a destination represents an amalgam of a diverse and eclectic range of businesses and people, who might have a vested interest in the prosperity of their destination community"*. A solid destination governance is therefore needed to ensure that all of these stakeholders operate under common goals (UNWTO, 2019). According to Serra et al. (2017), governance here refers to mechanisms for the self-control of both individual and collective actors in the destinations, such as rules, contracts, negotiations, money or knowledge. As the authors argue, this fluid cooperation between stakeholders is needed,

as a destination cannot be controlled in a hierarchical way as companies would be. Within this process of stakeholder collaboration, Destination Management Organizations (DMOs) are tasked to be the coordinators and network managers, leading the way under a coherent strategy and collective vision (Serra et al., 2017; UNWTO, 2019). In this regard, the role of DMOs, which were traditionally focused on destination marketing, is becoming far broader (UNWTO, 2019). In order to manage a destination effectively, DMOs will need to develop adaptive capacities to deal with exogeneous factors, such as climate change, terrorism or changing international relations (Gowreesunkar et al., 2018; Hartmann, 2016), as well as innovation capabilities to ensure destination competitiveness and sustainability (Buckley, 2012). As the UNWTO (2019) highlights, DMOs have the strategic role to incorporate the United Nation's 17 Sustainable Development Goals (SDGs) into their plans and policies and to monitor the implementation of these goals on an ongoing basis with the final goal to maximize the contribution of the tourism destination as a whole to the SDGs. The relevance of Sustainable Destination Management is reflected in the *"UNWTO Guidelines for Institutional Strengthening of Destination Management Organizations"* (2019), which outlines 64 success indicators for effective DMOs across the three key performance areas strategic leadership, effective execution and efficient governance.

2.2 The Relevance of Measuring and Monitoring

Because sustainability and sustainable development have been a point of focus for the academic literature since a few decades, one could assume that nowadays there is a consensus about the term and its definition. However, rather paradoxically, the opposite seems to be the case – as Bloyer et al. (2004) note, the concept of sustainability is still criticised as being vague or even confusing. In the tourism domain, based on different interpretations, it has become a form of ideology, political catch phrase or, depending on its context, can range from concept to philosophy, process or product (Wall, 1997). As research shows, this imprecision of the concept lends itself to misuse or even abuse by different stakeholders (Butler, 1999; Cohen, 2002). Furthermore, as Bloyer et al. (2004) argue, this imprecision hinders monitoring the success of implementing plans for sustainable tourism development in the destinations. Butler, quoting the English Countryside Commission, highlights the need for such monitoring: "*A commitment to monitoring is essential. Without any commitment to measuring impact on either a qualitative or quantitative basis, it is impossible to decide whether one is moving towards*

sustainable tourism or away from it" (Countryside Commission, 1995: 9 in Butler, 1999). The UNWTO reinforces the need for continuous monitoring, and considers it to be one of the preconditions to be able to introduce preventive or corrective measures in order to achieve sustainable tourism (UNWTO, 2004)

Several tools and practices have been developed to address evaluation and control of tourism activity (Marinello et al., 2023). Amongst these tools are environmental impact assessments, Life Cycle Assessments, environmental auditing, ecological footprint, multi-criteria analysis, adaptive environmental assessments and sustainability indicators (Schianetz et al., 2007), whereas sustainability indicators have emerged as the most commonly and internationally used tool (UNWTO 2004). As Marinello et al. note, the popularity of this tool is based on its *"[…] simplicity of formulation and use, its applicability to different spatial levels (from the supranational to the local level), the modularity and flexibility, the possibility of using it for quantitative or qualitative purposes and, finally, its interdisciplinarity.*" (2023:3).

The UNWTO describes indicators as *"measures of the existence or severity of current issues, signals of upcoming situations or problems, measures of risk and potential need for action, and means to identify and measure the results of our actions."* (UNWTO, 2004:8). As they outline further, indicators can be based on both quantitative as well as qualitative data and should be constructed to provide meaningful information for the management of key issues in the destination. In an environment where managers nowadays often have to operate in environments that are *"data-rich but information-poor"*, indicators can support to select, process, analyse and report on the right data that links to sustainability issues (UNWTO, 2004:10). Indicators can thus serve as an early warning system for destination managers to signal potential risks and required actions as well as the most relevant fields for action towards achieving sustainable tourism in a destination. As Schianetz et al. (2007) note, it is highly relevant to develop a combined and integrated set of tools when focusing on the destination level as only a comprehensive assessment on the potential impacts on environment and communities in a destination can negative avoid trade-offs and potential shifts of problems from one area to another.

Having such a comprehensive view on the links between tourism and the natural, economic and socio-cultural environment is key for a successful management of a destination, as summarized by the UNWTO (2004) and depicted in Figure 2.1.

Figure 2.1 Benefits from the implementation of sustainability indicators

1. Better decision-making - lowering risks or costs;
2. Identification of emerging issues - allowing prevention;
3. Identification of impacts - allowing corrective action when needed;
4. Performance measurement of the implementation of plans and management activities - evaluating progress in the sustainable development of tourism;
5. Reduced risk of planning mistakes - identifying limits and opportunities;
6. Greater accountability - credible information for the public and other stakeholders of tourism fosters accountability for its wise use in decision-making;
7. Constant monitoring can lead to continuous improvement - building solutions into management.

Source: Own depiction based on UNWTO, 2004

2.3 Gaps and Potentials in Measuring Tourism Sustainability

After having reviewed theoretical evidence for the relevance of measuring and monitoring of sustainability in tourism, the following subsections will give an in-depth view on existing assessment methods for sustainable tourism, in particular tourism indicator models. This is followed by an investigation of digitalization aspects and the concept of smart technologies and their current representation in assessment of sustainable tourism. In the last subsection, the paper turns to the concept of maturity models and how it can be leveraged to provide value to the assessment of sustainability in tourism.

2.3.1 Reviewing Existing Assessment Models

In the past two decades, a number of operational tools and frameworks around tourism indicators have been created by various actors in the tourism sphere (EC, 2016; GDSM, 2019; GSTC, 2019; UNWTO, 2004; WEF, 2019). Researchers have further developed those tools to account for specific tourism contexts or territorial characteristics that need to be considered to correctly assess the level of sustainable development (e.g. Choi and Sirakaya, 2005; Crotts et al., 2022; Gato et al., 2021; Punzo et al., 2022; Schianetz and Kavanagh, 2008; Zhang et al., 2022). As a consequence, nowadays a plethora of sustainability indicators exist, which are poorly aligned and do not follow a pattern (Agyeiwaah et al., 2017; Marinello et al., 2023; Santana et al., 2019). While some of the defined indicators, as Marinello et al. (2023) note, can be generally applied to different territories, others are specific to a certain destination context, resulting in too

many options to choose from for destination managers and a difficult comparability of results. In addition, as Santana et al. (2019) add, the given frameworks often lack clear definitions for the aspired targets, numerical values or thresholds for the indicators, thereby limiting their value in practical use. Sustainability indicators thus seem to not have completely fulfilled their purpose to provide more clarity and guidance for tourism practitioners yet. It is of no surprise that given these circumstances, Estêvão et al. (2019) note that a true implementation of practices to foster sustainability remains sporadic within the tourism sector.

For a more detailed analysis of the features of existing assessment models for sustainable tourism, models were selected based on a screening process with defined criteria, as described in Chapter 3.3.1. Four models resulting from this process were analysed regarding their features, dimensions and sub-domains (see Table 2.1): *"Indicators of Sustainable Development for Tourism Destinations"* (UNWTO, 2004), *"European Tourism Indicators System - ETIS"* (EC, 2016), *"GSTC Destination Criteria"* (GSTC, 2019) and *"Global Destination Sustainability Index – GDSI"* (GDSM, 2022). The model suggested by the UNWTO (2004) can be seen as one the most established and most comprehensive sets of sustainable tourism indicators currently existing. It has been developed by a wide range of experts and identifies more than 150 sub-components of sustainability, as well as varieties for specific destinations (e.g. coastal, maritime, mountain destinations). Including these variants, the UNWTO model consists of over 700 indicators that can be customised according to the territorial level of analysis. As highlighted in the UNWTO guidebook, the complete set of indicators should be understood as a menu, that allows tourism planners and managers to select those issues and indicators that are most relevant for the specifics of their destination. Out of the complete set, however, the UNWTO specifies twelve so-called *"baseline indicators"* as a suggested minimal set to be applied by a destination, allowing comparisons with other destinations. The European Tourism Indicators System (ETIS) has been developed by the European Commission to assess the impact tourism has on a destination and help the destination stakeholders to measure sustainability management processes and monitor their performance and process over time. In addition, the tool is designed to monitor destination attractiveness and competitiveness to make the right decisions for an enhanced visitor experience and customer satisfaction (ETIS, 2016). The Destination Criteria of the Global Sustainable Tourism Council (GSTC), in their second update since

their initial release in 2013, have been created to *"provide a common understanding of sustainable tourism"* (GSTC, 2019:2). They suggest a list of minimum criteria for a destination to aspire to as a means of contributing towards the UN's 2030 Agenda for Sustainable Development and the 17 SDGs. The scope of the GSTC criteria is broad, covering the entire tourism sector, and applicable to a wide range of destinations worldwide (e.g. urban, rural, mountain, coastal or mixed), from large to small ones. Lastly, the Global Destination Sustainability Index (GDSI) had initially been created by the Global Destination Sustainability Movement organization for the events and meeting industry but has been expanded to include leisure tourism in 2020. The GDSI aims at measuring, benchmarking and improving the sustainability strategy and hence the performance of tourism and events destinations. To ensure the quality and relevance of the GDSI, the criteria are being annually reviewed, including consultation and input from participating destinations, while ensuring alignment with the SDGs, the GSTC criteria as well as the UNWTO One Planet Sustainable Tourism Programme.

As Table 2.1 shows, the four models proposed by the different organizations show significant overlaps when it comes to the chosen dimensions, however they differ in the total number of indicators and the distribution of indicators across the dimensions. While the dimension of socio-cultural sustainability has a rather equal weight of around 30% in the models of ETIS, UNWTO (including indicators related to *Health and Safety*, *Wellbeing of Host Communities*, *Community Participation in Tourism* and *Sustaining Cultural Assets*) and GSTC (including the indicators of the socio-economic sustainability dimension that focus on *Social wellbeing and impacts*, as well as the dimension *Cultural Sustainability*), this aspect is relatively underrepresented in the GDSI model, with a mere 12% related to the indicators of *Social Progress Performance,* not specifically addressing culture. Environmental sustainability is the highest represented dimension in the models of ETIS and GSTC, with 40% and 37% of all indicators respectively, while only being accounted for with 19% in the GDSI model and 14% in the model of UNWTO (including indicators related to *Limiting Environmental Impacts of Tourism Activity*, *Managing Scarce Natural Resources* and *Protection of Valuable Natural Assets*). Economic sustainability is attributed with moderate importance of around 20% in the models of UNWTO (referring to as *Capturing Economic Benefits from Tourism*) and ETIS, but only 7% in the GSTC model (considering the indicators of the socio-economic sustainability dimension that focus on *Delivering local economic benefits*). The GDSI model focuses

on Supplier performance instead of an overall economic dimension and attributes 14% of indicators to this topic. Finally, all four models have included a dimension concerned with the governance and sustainable management of destinations. While this aspect has only a minor share of 7% of indicators in the ETIS model, it holds a share of around 30% in the GSTC and UNTWO model (indicators related *to Destination Planning and Control, Designing Products and Services, Tourist Satisfaction* and *Sustainability of Tourism Operations and Service*s), and even represents 54% of indicators of the GDSI model.

Table 2.1 Summary of the four assessment frameworks examined.

Author(s), Year	Indicators (total)	Dimensions	Indicators (per dimension)	Indicators (% of total*)
UNWTO, 2004	*716*			
		Limiting Environmental Impacts of Tourism Activity	*56*	*8%*
		Managing Scarce Natural Resources	*31*	*4%*
		Protection of Valuable Natural Assets	*12*	*2%*
		Health and Safety	*101*	*14%*
		Wellbeing of Host Communities	*84*	*12%*
		Community Participation in Tourism	*27*	*4%*
		Sustaining Cultural Assets	*10*	*1%*
		Capturing Economic Benefits from Tourism	*149*	*21%*
		Destination Planning and Control	*112*	*16%*
		Designing Products and Services	*69*	*10%*
		Tourist Satisfaction	*23*	*3%*
		Sustainability of Tourism Operations and Services	*5*	*1%*
		Controlling Tourist Activities	*36*	*5%*
EC, 2016	*43*			
		Environmental Impact	*17*	*40%*
		Social and Cultural Impact	*13*	*30%*
		Economic Value	*10*	*23%*
		Destination Management	*3*	*7%*
GSTC, 2019	*174*			
		Environmental Sustainability	*65*	*37%*
		Socio-economic sustainability	*32*	*18%*
		Cultural Sustainability	*26*	*15%*
		Sustainable Management	*51*	*29%*
GDSM, 2022	*169*			
		Environmental Performance	*32*	*19%*
		Social Progress Performance	*21*	*12%*
		Supplier Performance	*24*	*14%*
		Destination Management Performance	*92*	*54%*

Source: Own elaboration by the author; sequence of dimensions has been adjusted to facilitate readability, ratios have been calculated prior to further treatment of the data, such as clustering
*Minor deviations are a result of rounding

As noted before, there is some general criticism on the overall concepts of indicators for sustainable tourism. When reviewing the four models above in detail, some shortcomings can be identified that are in line with the general criticisms. In addition, gaps in the model design can be noted that may hinder the applications of these model by tourism practitioners. The below points describe these shortcomings and gaps in more detail:

Model Complexity and Alignment of Indicators

The common criticism of indicator models showing an overabundance of non-alignable indicators (Agyeiwaah et al., 2017; Marinello et al., 2023; Santana et al., 2019) hold true when reviewing the four models at hand. Ranging from 169 to over 700 indicators, at least three of the models provide practitioners with an overwhelmingly large amount of information and complexity. While the UNWTO (2004) explicitly state that their model is supposed to be seen as a *"menu"* (p.55) from which destinations need to choose the most relevant indicators, one could still argue that, despite the definition of twelve baseline indicators, the sheer amount of remaining options is difficult to handle for stakeholders that are not experts in the field of sustainability assessments. As Agyeiwaah et al. (2017: 30) argue, too many choices in fact represent the *"greatest inhibitor*" to a broad adaption of sustainable tourism practices.

In addition, the level of granularity and concreteness of the different indicators varies significantly within and in-between models. An example would be *"Existence of tourism plan - Up to date plan exists"* versus "*Number of charges for [land use] plan, zoning or site plan violations"* as indicators of the same hierarchy within their issue section on *"Destination Planning and Control"*. In absence of a weighting of the different indicators, this might lead to a distortion of results and an over- or underrepresentation of certain dimensions or sub-domains of the model without any theoretical justification (Ivars-Baidal et al., 2021b). The GDSI model attempts to address this issue by more precise definitions and adding a scoring system with a maximum number of points to be achieved for each indicator, e.g. *"Has the DMO's sustainability strategy and its development process been reviewed and/or updated and publicly released to key stakeholder groups within in the last 3 years? Please select all that apply:" a) Reviewed and/or updated in last 3 years (1 point); b) Publicly released to key stakeholder groups (0.5 points); c) Strategy describes consultation and development process (0.5 points).*

Nevertheless, they fail to provide transparency over the theoretical justification for the underlying scoring logic and resulting weighting of indicators. It is further due to the different levels of granularity and concreteness, that a lot of variations for indicators around the same topics exist between the models, which leads to a failure to provide real clarity and unambiguousness of the concept and elements of sustainability (Tanguay et al., 2013).

Scope of the Model

A too narrow tourism focus or neglection of specific dimensions within tourism indicator models has been criticised by different authors in the past (Twinning-Ward and Butler, 2002; Weaver and Lawton, 2014). What can be seen from the four models above is that they all agree on the environmental dimension of sustainability, albeit the relative number of indicators in this dimension varies between the models. In addition, social impacts of sustainability are accounted for by all models in varying extent, cultural impacts are only included in three of the four models. With regards to economic impacts of sustainability, the four models show a rather large difference in focus and level of detail. Finally, all four models have included a dimension that deals with sustainable management of the tourism destination, however the sub-topics within this dimension vary to a large extend between models.

What is interesting to note when reviewing the four assessment models, is that none of them puts a specific emphasis on aspects related to technology or data analytics. The GDSI model merely includes an indicator of whether the destination has a *"system to measure and monitor the environmental, economic, and social impact and performance of tourism"* as well as an (however unmarked) indicator, asking for *"[…] an example where data collected on the impact of tourism and/or events influenced strategy development"*. In the GSTC model, a similar criterion with related indicators that reviews if *"The destination is implementing a system to monitor and respond to socio-economic, cultural and environmental issues and impacts arising from tourism. Actions and outcomes are regularly monitored, evaluated and publicly reported."*. In both of these models, however, this element is phrased rather vaguely, leaving a lot of room for subjective interpretation and hence failing to provide true guidance for practitioners.

"Benchmarking" and Targets

As noted above, Santana et al. (2019) criticize that existing sustainability assessment models often fail to provide clear definitions for the aspired targets, numerical values or thresholds for the indicators which limits their practical value. This critique applies in parts to the four models under investigation. While the GSTC and ETIS models do in fact not give any details on targets or thresholds, the UNWTO model gives at least recommendations on how to gather regional or national benchmark data for each indicator. The GDSM, in their consulting function, follow a different approach in two ways: first, numerical ranges are given for quantitative indicators, such as *"What percentage of the city's total electricity consumption comes from renewable sources?" -> 40% - 4 points; 30% > 39.9% - 3 points; 20% > 29.9% - 2 points; 10% > 19.9% - 1 point; < 10% - 0 points).* Secondly, destinations who want to complete the GDSI assessment, can do so via the organization data portal, after which GDSM consultants evaluate the submission and release benchmarking results to the destination.

Guidance for Implementation

As existing assessment models are being often perceived as vague and complex, they might require specific guidance for implementation by tourism practitioners. Out of the four assessed models, two give indications on a proposed implementation process within the destination. Included in the UNWTO model (2004) is a detailed 12-step process for the selection and implementation of tourism indicators using a participatory approach. The ETIS framework also included a seven-step implementation guide that includes the selection of relevant indicators with the help of a cross-disciplinary stakeholder working group. The GSTC and GDSI model both do not specify a process for implementation or stakeholder participation, nor do they address options to select or modify the indicator set based on the destinations' requirements.

Displaying and Communicating Data

Morrey (1997) notes that indicators need to be understandable and be communicated to promote behavioural change. Waldron and Williams (2002) specifically suggest that a presentation of indicators should explain the methodology, underlying assumptions and meanings of the indicators, highlight how they compare to the past and a future goal or benchmarks, and be graphically represented to allow for a visual and intuitive

interpretation by different stakeholders. While the literature review did not reveal any details about the presentation of the GDSI result, it can be said that the other three models fail to provide features for a clear display and communication of assessment results. This shortcoming might additionally hinder application of the models in practice and limit the informative use for different stakeholder groups which are not directly involved in the assessment process, such as the general public.

Translating Data into Action

White et al. (2006) state that indicators themselves *"are not intended to accomplish the required change, but rather […] act as catalysts for change, providing an 'early warning system', flagging up areas of concern thus enabling decision-makers to initiate the necessary policy changes and remedial measures"* (p.6). As the authors elaborate further, whilst monitoring with the use of indicators needs to be a closely integrated part of a destination's decision-making and learning cycle, destinations need to ensure that "*energy [is] directed towards achieving sustainability, not just measuring it"* (White et al., 2006 quoting DSCWG, 2001). Twinning-Ward and Butler (2002) argued that an earlier version of the UNWTO indicator model lacked an appropriate framework which would help exactly with translating the information from indicators into suitable management actions. This criticism holds true for the current models of UNWTO, GSTC and ETIS as reviewed above. For the GDSI model, while there is no information on the provision of such framework available online, we do not have detailed insights into the details of strategy and implementation recommendations destinations receive as part of the Performance Improvement Report that is generated by GDSM following the assessment. Due to the above-mentioned complexity and ambiguity of the models, such an action framework or guidance would be highly relevant for a successful implementation of the models in practice (Agyeiwaah et al., 2017) and to ensure that destinations don't just engage in an ineffective measurement exercise.

2.3.2 Digitalization and its Reflection in Existing Assessment Models

Information and communications technology (ICT) research shows how the tourism industry has been forever altered by the increased use of technology and authors such as Buhalis and Law (2008) argue that technology will remain one of the greatest influences to drive change within tourism. This development has only been acerbated by

the effect of the Covid-19 pandemic, which has accelerated the process of digitalization across all industries, amongst which the tourism sector (Elkhwesky et al., 2022). In order to manage the new demands of the pandemic, around the new normal, contactless, hygiene and cleanliness, tourism business managers worldwide had to ramp of the use of technology, e.g. with regards to intelligent means such as AI, robotics, sensors, digital marketing or booking services (Cheng et al., 2022). While digital transformation might not have been on top of the agenda of tourism establishments before, as Cheng et al., (2023) argue, it has rapidly become a critical factor for competitiveness and survival. This includes the many small and medium sized enterprises within the tourism sector who have been put under severe pressure to compete in this rapidly changing environment and transform their businesses through the application of digital technology (Surya et al., 2022). As a side-effect of this rapid digitalization of the industry, is that through the increased application of cloud technology by stakeholders in the tourism sector, big data capabilities are being developed that app the storage, computing and assessment of data without and time or boundary constrictions (Buhalis and Leung, 2018). As Buhalis and Leung (2018) note further, this enables bridging the before existing information gaps between all stakeholders in the tourism ecosystem (customers and suppliers).

For a long time, the contribution and potential exploitation of ICT to support the development of sustainable tourism remained an underexplored gap in tourism research (Ali and Frew, 2014a; Dao et al., 2011; Melville, 2010). As Ivars-Baidal et al. (2021b) note, however, the focus of how technology can support more effective information management, decision-making and stakeholder engagement to drive sustainable tourism development is now on its way to become a dedicated research stream with large potential (Ali and Frew, 2014b; Benckendorff et al., 2014; Goessling, 2017, 2021).

This research stream seems to run in a way parallel to research dedicated to the concept of *"smart tourism destinations"* (STs). The concept of STs is a further development of the concept of smart cities, as described by Caragliu et al. (2011). Lopez de Avila, former president of SEGITTUR, Spain's state company for the management of tourism innovation and technologies, defines a ST as *"an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life"* (cited in Gretzel et

al., 2015:180). According to Gretzel et al. (2015), STs achieve these benefits by collecting and using data from different sources and combining it with advanced technologies to create new experiences as well as commercial value propositions. Buhalis and Amaranggana (2015) add that ICT can foster the interconnection of a multitude of stakeholders, the development of knowledge-intense communication flows, digitalization of core processes for businesses as well as organizational agility. In an earlier work, the authors already noted that a smart destination environment based on ICT allows for a quicker and more flexible response to changes in the destinations' context (Buhalis & Amaranggana, 2013). This characteristic of ICTs provides a crucial element for destination competitiveness (Ali and Frew, 2013; Shafiee et al., 2019), which nowadays does not only derive from the exploitation of natural resources but from effective management and the ability to optimally allocate resources (Wang et al., 2013). Because of this immense impact of ICTs, Shafiee et al. (2019:298) predict that the development of STs will *"radically alter the tourism industry and offer a better future for tourism-based economies and sustainable tourism".*

What is common to all research on the relationship of ICT or *"smartness"* and sustainable tourism, is that authors highlight the potential impacts on the environmental, socio-cultural, economic and destination management dimensions alike. Ali and Frew (2013), for example, note how ICT can drive environmental sustainability through its application in managing and controlling tourism development and the identification of sensitive areas. The authors add, that, in terms of economic sustainability, ICT can be leveraged to better manage and provide fast, accurate and up-to-date information, and to map and monitor economic impacts. In the context of socio-cultural sustainability, the use of smartphone and sensor data can help to tackle overtourism, preserve historical attractions and improve residents' quality of life, e.g. by managing tourist flows, optimizing parking sites and dispersing tourists away from congested areas (Lawson, 2006; Soares et al., 2022; Stephenson and Dobson, 2020). With regards to sustainable destination management and governance, Soares et al. (2022) highlight the use of ICT and open data for enhanced stakeholder collaboration and decision-making processes. DMOs can leverage real-time, contextual visitor data to acquire better knowledge and understanding of their customers' needs and, based on this, enhance the tourism experience, improve business operations and, eventually drive competitiveness (Shen et al., 2020).

While all of these potential benefits of ICTs on sustainable tourism are noted in theory, it is interesting to see that hardly any of the existing smart city or smart destination concepts translate this into measurable actions (Hoejer and Wangel, 2015; Ivars-Baidal et al., 2021b). Ivars-Baidal et al. (2021b) focus on this topic by reviewing the contributions made by smart cities and smart destinations to the design and implementation of sustainable tourism indicators and find that, despite the potential that the use of ICT in smart cities and destinations theoretically offers, up to this date only little progress has been made in sustainability measures. As a result, the authors note a need for researchers, policy makers and planners to redesign indicator systems to fully account for sustainability aspects and integrate these into smart city and smart destination agendas, models and continuous management.

2.3.3 Using Maturity Models to Assess Tourism Sustainability

Originating from Information Systems (IS) research and the so-called *"Capability Maturity Model"* (Paulk et al., 1993), hundreds of maturity models (MMs) have been developed by researchers across different domains and are most commonly applied in business practice by software companies and consultancies (Poeppelbuss & Roeglinger, 2011). A simple Google search demonstrates how widespread MMs are nowadays as a classical tool of both the Big Four consulting companies as well as strategic consultancies and how they are applied across a wide range of specific domains and use cases (Hein-Pensel et al., 2023), from digital capabilities to leadership, environment, health & safety or compliance, to name a few (e.g. Bain & Company, undated.; Deloitte Consulting, 2018, 2022; Ernst & Young, undated; KPMG, undated; McKinsey, 2017; PwC, undated). The current body of academic literature related to MMs is still small and most commonly related with the IS domain e.g. (Becker et al., 2009; de Bruin et al., 2005; Lasrado et al., 2015). However, academic interest in the subject has increased over the last years (Becker et al., 2010) and some recent applications of the concept will be outlined in the course of this section.

In the context of MMs, maturity can be seen as "*a measurement of the quality, competency or level of sophistication of a set class of objects*" (Warnecke et al., 2019: 657). In general, MMs are based on the assumption that organizational development follows predictable patterns of evolution and change (Gottschalk 2009, Kazanjian & Drazin 1989). In a MM, these patterns are conceptualized in terms of linear, evolutionary

stages or levels that indicate how the capabilities of an organization progressively evolve along a desired, expected, or logical maturity path (Poeppelbuss & Roeglinger, 2011). There are two forms of MMs: staged and continuous MMs (Bley and Schoen, 2019). In both models, each maturity level is defined by a set of widely accepted and generalizable criteria, descriptors or benchmark variables (Becker et al., 2010; Warnecke et al., 2019). The bottom level hereby usually represents an initial stage of development whereas the highest level reflects total maturity with high performance (Warnecke et al., 2019). In a staged model, an entity can only achieve an overall higher maturity level after all requirements of the previous level have been met (Bley and Schoen, 2019). In continuous MMs, however, as the authors describe, maturity is executed on different levels, meaning that the final maturity score can be defined as a weighted sum of single characteristics on different levels or several maturity levels in various dimensions.

Maturity models are commonly applied as a strategic tool to perform comparisons of current and desirable maturity levels, to determine a path or roadmap for each level depending on existing maturity gaps and eventually to control the progress of their implementation (Becker et al., 2010; Hein-Pensel et al., 2023; Poeppelbuss & Roeglinger 2011; Warnecke et al., 2019). Poeppelbuss & Roeglinger (2011: 3-4) emphasize this three-fold purpose of MMs with what they describe as "*descriptive, prescriptive and comparative*" benefits. With regards to their descriptive purpose, MMs can be used as a diagnostic tool (Maier et al. 2009) to assess the current capabilities of an entity with respect to given criteria (Becker et al. 2009). The resulting maturity level can be used for communication to internal and external stakeholders (Poeppelbuss & Roeglinger 2011). MMs can serve a prescriptive purpose to identify desired future maturity levels and, based on the results of the as-is analysis, provide relevant guidance to derive and prioritize improvement measures and courses of action to reach this level of maturity (Becker et al. 2009; Maier et al. 2009). Finally, MMs have a potential comparative purpose as they allow internal or external benchmarking. Internal benchmarking and monitoring of progress over time can be done in the presence of sufficient historical data (Poeppelbuss & Roeglinger, 2011). In addition, external benchmarking can be done through comparison of maturity levels of similar entities (Maier et al. 2009).

Despite their broad application in practice, maturity models are not without criticism from research. Poeppelbuss & Roeglinger (2011), for example, criticise that

MMs often lack empirical foundation, as model structures are being copied without consideration of a conceptual basis in literature. Lasrado et al. (2015) further criticise lacking validation for selected variables and dimensions and point out a missing operationalization of maturity assessments. Finally, Mettler and Rohner (2009) argue that maturity models need to be configurable in nature, as the internal and external characteristics of different entities may vary to a degree that constrains the applicability of one standard model.

As mentioned above, MMs have started to spread outside the realm of the IS domain have across different industries and are nowadays more commonly used. Bley and Schoen (2009) note that MMs are especially applied in the context of defining, delimiting and accounting for new and emerging social or technological phenomena (such as digitalization or Industry 4.0) and its impact on organizations or other entities. When looking at the sustainability domain, a small number of applications of MMs can be found in literature. However, these studies are mainly focused on organizations' supply chain and environmental management capabilities, as summarized by Aguiar et al. (2021). Applications of MMs in the context of tourism are scarce and mainly also follow the IS perspective by focusing on smart tourism. Lim et al. (2019), for instance, build upon existing applications for smart cities (Aljowder et al., 2019; Santana et al., 2019; Suliman et al., 2019; Warnecke et al., 2019) to develop a capability maturity framework for smart tourism destinations. Their framework builds on six critical capacities with corresponding maturity levels that can support tourism practitioners in the identification of capability paths towards a sustainable and smart tourism governance, thereby enabling sustainable tourism innovations. Imboden et al., (2022) apply the principles of smart destinations to develop a maturity model for lesser-known, peripheral mountain resorts based on six dimensions with related indicators and defined maturity levels. With their model, they aim to provide a development tool for destinations with limited means and resources to plan investments and define priorities to evolve on their trajectory towards smart tourism destinations. Afonso et al. (2015) use public data mining to define a regional maturity model in order to measure and assess differences of smart cities in Brazil and to propose managerial mechanisms to improve social and economic policies based on these findings. Within the context of a bachelor's thesis, Blaser (2019) addressed the need for a general maturity model for Smart Tourism Destinations and proposed a design that especially focuses on destinations' ability to collect and analyse data from social media, Open Data

and the Internet of Things. What can be seen from these few applications is that maturity models have the potential to go beyond an assessment of a current state of performance metrics, like it is the case for indicator models, and add value for practitioners by providing guidance on improvement measures that are required for a further development within a given domain.

3 METHODOLOGY

Following the literature review, the purpose of this chapter is to outline the research design and research methodology employed in the dissertation. The research process is depicted in its different stages, followed by a detailed description of each stage and the techniques that were applied for data collection, analysis and evaluation.

3.1 Research Problem and Plan

As the literature review has shown, there is an urgent need by stakeholders in the tourism industry to understand the concept of sustainability and implement the appropriate actions to make sure their destinations follow the right developmental path. However, as the concept of sustainability is often perceived as vague and therefore complex to address, a thorough measurement and monitoring of initiated actions based on widely acknowledged indicators is key. Current models of sustainability indicators try to tackle this challenge, but often lead to even more complexity for stakeholders in the tourism field due to the sheer number of indicators and their lacking clarity and description. In addition, aspects of the growing digitalization of the tourism industry and its potentials to drive sustainable development have not been sufficiently acknowledged in existing sustainability assessment models.

As a result, it was perceived that these existing gaps in the assessment of tourism sustainability deserve a specific focus and the need to propose a comprehensive solution that can help destination managers address the challenges of sustainable development in their location.

Overall, the dissertation poses the following key research questions:

- What are relevant characteristics of sustainable tourism destinations and the factors that hinder an efficient assessment and monitoring of the development status of these characteristics with existing models?
- Can these factors be employed to develop a new, more complete model framework to improve the assessment of sustainability in tourism destinations?

The overarching goal of this dissertation is therefore to develop a new and more complete assessment model for sustainable tourism that combines existing sustainability indicator models with a maturity model concept and adds a technology perspective, to

simultaneously address the need for digitalization; thereby providing an evolutionary step to traditional assessments of tourism sustainability or assessments specifically focused on Smart Tourism Destinations. This way, the model aims at answering to the current demands of managers with regards to sustainability in destinations of various developmental stages from well-established to new ones. In addition, it aims to be applied in all stages of a destinations planning cycle, either to strengthen and support continuous improvement for an existing plan, or as a catalyst to initiate a new planning process (UNWTO, 2004).

This research goal is supported by the following specific objectives:

- To understand the scope needed to assess sustainable tourism destinations.
- To examine gaps of existing assessment models for sustainable tourism.
- To assess potentials to relate the concept of Smart Tourism to the measurement of tourism sustainability.
- To explore how maturity models be leveraged to assess sustainable tourism.
- To develop a comprehensive maturity assessment model framework for sustainable tourism based on existing assessment models and including aspects of digitalization.
- To suggest recommendations for practitioners for the application of the model.
- To outline policy recommendations and implications for tourism agencies.

Table 3.1 outlines how the dissertation addresses the underlying research objectives.

Table 3.1 Planning matrix for dissertation

Research Objectives	Relevance	Conceptual Framework	Information needs	Approach/ methodology
Understand the scope needed to measure sustainable tourism development in destinations	Provide clarity to the concept of sustainable tourism destinations as critical baseline for measuring and monitoring destinations' development status	Define the relevant dimensions of sustainable tourism destinations	Review of the relevant literature on sustainable tourism, sustainable tourism destinations and measurement and monitoring of sustainable tourism	Literature review to define the theoretical framework and scope of the maturity model
Examine gaps of existing assessment models for sustainable tourism	Define missing concepts or links that need to be addressed through the proposed model	Assess criticism around existing assessment models, in particular sustainability indicator models	Review of existing assessment models from research and practice	Literature review, selection of models and document analysis to define the guiding principles for the model design
Assess potentials to relate the concept of Smart Tourism to the measurement of tourism sustainability	Closing gaps of existing assessment models by adding a perspective of digitalization	Identify potential of digitalization to drive sustainable development across different sustainability dimensions	Review of the relevant literature on smart tourism and ICT for sustainable tourism	Literature review to identify relevant aspects for the maturity levels in each sub-domain of the proposed model

Table 3.2 Planning matrix for dissertation (continued)

Research Objectives	Relevance	Conceptual Framework	Information needs	Approach/ methodology
Explore how maturity models be leveraged to assess sustainable tourism	Closing gaps of existing assessment models by adding the perspective of a maturity development path	Assess the basic concept of maturity models and its application in the context of sustainability and tourism	Review of existing maturity models and their design process	Literature review to assess suitability of application of maturity model concept for tourism assessments
Develop a comprehensive maturity model framework for sustainable tourism based on existing assessment models and including aspects of digitalization	Providing a comprehensive tool for destination managers to assess their current maturity level, define their desired target state and identify priorities and actions for future development	Designing a new, more complete assessment model for sustainable tourism destinations through combination of existing indicator models with a maturity model concept and adding a digitalization perspective	Review of existing sustainability indicator models and smart destination assessment models	Document analysis of reference models as baseline to detail dimension, sub-domains and related maturity levels in the model
How can the proposed model be validated?	Assess simplicity, coverage/ completeness, usefulness and implications for implementation of the model	Assessing the model's potential performance towards its defined objectives	Insights and feedback from different experts and tourism stakeholders	Semi-structured interviews with tourism experts and stakeholders
Suggest recommendations for practitioners for the application of the model	Detail considerations for practical implementation of the model in a destination	Develop guidance for destination managers on the maturity assessment process	Combination of review of existing literature regarding tourism assessments and insights and feedback from different experts and tourism stakeholders	Literature review and content analysis of the semi-structured interviews
Outline policy recommendations and implications for tourism agencies	Detail which implications an application of the maturity model can have for policy development and tourism agencies	Define the linkages of the maturity model, local tourism policy and tourism agencies	Combination of review of existing literature regarding policy design and insights and feedback from different experts and tourism stakeholders	Literature review and content analysis of the semi-structured interviews

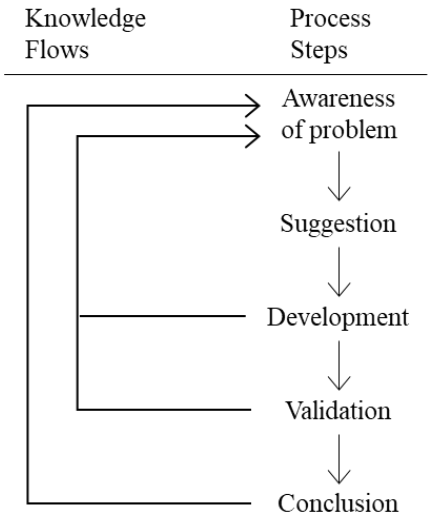
Source: Own elaboration by the author, adapted from Choguill (2005)

The research method chosen for the dissertation is based on a Design Science Research (DSR) approach (Hevner and Chatterjee, 2010). DSR aims at creating innovative artifacts, such as constructs, models, methods and instantiations, with the purpose of solving human or organizational challenges (Hevner et al., 2004). DSR thus has a focus on practical problem-solving and involves specialized knowledge that is aimed at finding solutions to specific, real-world issues. Through scientific reasoning such as forecasting, recognizing or clarifying phenomena, solutions can be developed to tackle complex and relevant everyday problems. Essentially, DSR is centred around addressing challenges in a particular field from a solution-oriented perspective. This approach can be applied to develop knowledge that is valuable to professionals in that field, allowing them to design solutions for their own everyday problems by exploring and evaluating other strategies to address these issues. (Van Aken and Romme, 2009)

Due to its specific focus, the DSR approach has been used frequently for the design of maturity models in IS research (e.g. Cardoso and Su, 2022; Hain and Back, 2011; Lim et al., 2019; Warnecke et al., 2019). As Mettler and Rohner (2009) argue,

maturity models form a design artifact type, that is *"somehow in-between"* (p.2) models and methods, because they combine both state descriptions (i.e. distinct maturity levels) with activities (i.e. methods for the assessment of maturity, identification of maturity gaps, prioritization and assessment of improvement measures).

Figure 3.1 High-level Design Science Research framework



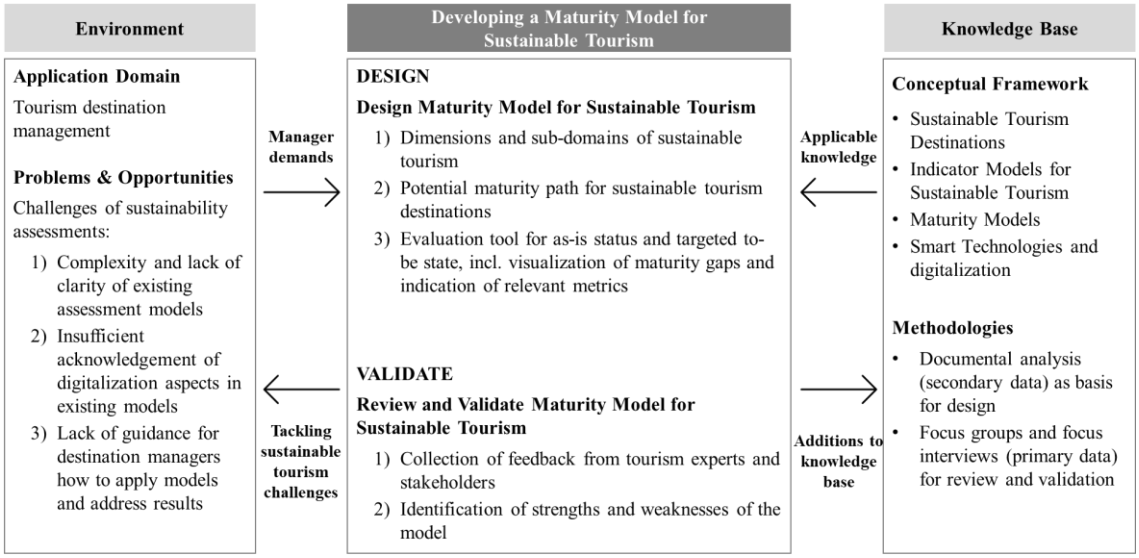
Source: Own elaboration by the author, adapted from Hevner & Chatterjee (2010)

Given the nature and goal of the present dissertation, i.e. to propose a conceptual solution for a practical, real-life problem, the researcher decided to proceed with the design science approach. The dissertation uses the different steps of the DSR approach as suggested by Vaishnavi and Kuechler (2007), i.e. awareness of the problem, suggestion, development, evaluation, and conclusion (see Figure 3.1, adapted from depiction by Hevner & Chatterjee, 2010). First, a literature review was performed to understand the theoretical concept of sustainable tourism destinations and measuring sustainable tourism development and to identify the research gaps to be addressed (Chapter 2.1 and 2.2). Subsequently, a deeper investigation of existing assessment models for sustainable tourism, the reflection of digitalization aspects in tourism sustainability assessments and the use of maturity models to assess tourism sustainability was performed in order to identify missing concepts or links that need to be addressed through the proposed conceptual solution (Chapter 2.3). In the development phase, the conceptual approaches and theories were united to design the actual deliverable, i.e., a maturity assessment model for sustainable tourism (Chapter 4). The suggested model was then validated and indications for the practical implementation of the model were given (Chapter 5). The

study was concluded with potentials for further research, policy recommendations and implications for tourism agencies (Chapter 6).

DSR research can generally utilize both quantitative and qualitative methods, depending on the purpose of the research (Offermann et al., 2013). Among other elements of the research design, the research methods employed in a study are determined by what the study involves and its particular perspective (Maxwell, 2009). Qualitative interviews, quantitative surveys, field or case studies are potential methods to underpin the rigor and study socio-technical characteristics such as usefulness of a designed artifact (Hevner and Chatterjee, 2010). This evaluation of the design artifact is an essential part of DSR as it provides essential feedback on the design process and the developed product (Hevner et al., 2004). As Hevner et al. (2004) note, a design artifact can be considered effective and complete when it meets all the necessary requirements and constrains for addressing the problem it was created to solve. Becker et al. (2010) hereby specifically note the potential to conduct applicability checks with practitioners in the relevant field as a qualitative method for the validation of maturity model artifacts, or even more sophisticated empirical models, as applied for example in the works of Kazanjian and Drazin (1989) or Sari et al. (2021). For the present study, a qualitative approach will be used. A more detailed, quantitative evaluation approach would be a next step in a refinement and advancement process for the designed model but is out of scope for the work at hand.

Figure 3.2 Research overview for dissertation



Source: Own elaboration by the author, adapted from Lim et al. (2019)

Figure 3.2 gives the research overview for the dissertation at hand. In line with the recommendations from Becker et al. (2009), secondary data was collected from scientific and non-scientific resources across different domains as baseline for the Design stage. As Bowen (2009) notes, document analysis is a frequently applied, systematic procedure for the review or evaluation of documents as part of qualitative research. Potential uses of this procedure are to provide data on the context, historical roots, changes and developments of the respective research field, suggest potential questions that need to be addressed within the research and to verify findings or validate evidence from other information sources (Bowen, 2009). A comprehensive document analysis was hence applied in the current dissertation to investigate the underlying concepts and research gaps and identify which missing concepts or links in existing assessment models for sustainable tourism need to be addressed in the new proposed conceptual solution.

In the validation stage, semi-structured interviews with tourism experts and stakeholders were conducted to further support construct validity of the designed model and to ensure that the incremental development of the model held practical relevance. As De Bruin et al. (2005) note, construct validity is achieved by both content validity (as a result of a broad and extensive literature review) and face validity. As the authors describe, face validity assesses whether the theoretical constructs have been well translated into the maturity model, by means of focus groups or interviews. The desired result of the validation phase should therefore be that the designed maturity model is *"considered complete and accurate with respect to the identified scope of the model"* (De Bruin et al., 2005:8).

Research interviews have been established as essential qualitative research method across different methodological approaches, as they enable the interviewer to gain in-depth insights into the perspectives, experiences, motivations and beliefs of the participants (Gill et al., 2008). As Gill et al. (2008) point out, interviews can be structured, semi-structured or unstructured, depending on the purpose of the study, whereby semi-structured interviews generally provide some guidance to the interviewees based on several predefined questions, but also enable them to discuss topics that are important to them. As the authors point out further, interviews can be held both face-to-face or by means of digital methods, if needed due to differences in location. For the present dissertation, a semi-structured interview approach has been chosen due to its flexibility

and the opportunity to discover or elaborate additional information that is important to the participants but may not have been considered relevant of the researcher (Gill et al., 2008).

3.2 Conceptual Framework

This section gives a brief overview of the key concepts that form the baseline for detailed investigation in this dissertation.

Sustainable Tourism Destinations

Sustainable Tourism is defined by UNEP and UNWTO as "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNEP and UNWTO, 2005: 12). Due to the complexity of the tourism industry and the involvement of various stakeholders, Schianetz et al. (2007) argue that the destination or regional level holds special significance for the implementation of triple bottom line sustainability. The management of sustainable tourism destinations therefore requires collaboration, sustainable tourism policies, responsible business practices, and community engagement to ensure that sustainability targets are being achieved (UNWTO, 2019).

Indicator Models for Sustainable Tourism

The UNWTO describes sustainable tourism indicators as "measures of the existence or severity of current issues, signals of upcoming situations or problems, measures of risk and potential need for action, and means to identify and measure the results of our actions." (UNWTO, 2004:8). In this sense, indicators can rely on both quantitative as well as qualitative data and need to be constructed so that they provide meaningful information for the management of key issues in the destination.

Maturity Models

Maturity models originate from IS research and the so-called *"Capability Maturity Model"* (Paulk et al., 1993), but are nowadays applied across a wide range of domains to measure "*the quality, competency or level of sophistication of a set class of objects*" (Warnecke et al., 2019: 657). Maturity Models are based on the assumption that organizational development follows predictable patterns of evolution (Gottschalk 2009,

Kazanjian & Drazin 1989), conceptualized in terms of linear, evolutionary stages or levels (Poeppelbuss & Roeglinger, 2011). Poeppelbuss & Roeglinger (2011: 3-4) describe "*descriptive, prescriptive and comparative*" benefits of maturity models, meaning that they can be used for as-is assessments, to identify desired future maturity levels and to conduct benchmarks regarding maturity levels of other, similar entities.

Smart Technologies and Digitalization

Digitalization and the rise of smart technologies build the basis for the emergence of Smart Tourism Destinations. De Avila defines a Smart Tourism Destination as *"an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life"* (cited in Gretzel et al., 2015:180). As different authors argue, the application of smart technologies and increased digitalization holds great potential for a sustainable development of destinations across various dimensions (Ali and Frew, 2013; Shen et al., 2020; Soares et al., 2022; Stephenson and Dobson, 2020).

3.3 Data Collection and Treatment

As stated before, this dissertation uses a qualitative research approach. As Hevner and Chatterjee (2010) note, qualitative approaches focus on personal hearing, observing, or living through the existence of study participants, in order for the researcher to gain awareness of stakeholders' views. Within the conceptual manner of the present study, it was decided to use a two-fold approach, assessing secondary data as baseline for the design of the proposed model, and gathering and analyzing primary data for the validation of the model. Primary data hereby signifies new, previously unexamined and unexplained data, while secondary data denotes data collected from existing sources, which has been previously examined and explained (Myers, 2009).

The approach for the collection of secondary data for the model design involved the review of literature at two levels to determine the guiding principles for the design of the proposed model. The first level of literature review hereby focused on the general concepts underlying the model design, whereas the second level investigated existing

assessment models in-depth to identify missing concepts or links that need to be addressed through the new proposed conceptual solution.

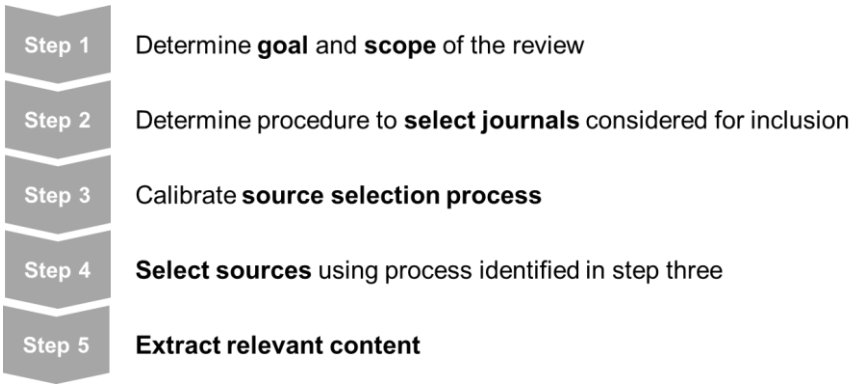
3.3.1 Literature Review

Generally, literature is reviewed in research to acquired knowledge in order to support theories or claims and hereby provide a basis and theoretical foundation for the study (Oates, 2006). In the context of DSR, Hevner and Chatterjee (2010) note that the review of literature is not only needed to review the models and frameworks as such, but also to examine the design process, knowledge and capabilities of other researchers.

The literature review for this study entailed a review of journals, books, conference papers, dissertations, reports and other electronic information associated with the relevant field of study. The objective of the general literature review was to clarify the underlying concepts for the design of the proposed model and to reveal current gaps and potentials in research regarding the study's focus area.

As depicted in Figure 3.3 and described below, the general literature review followed a simplified version of the six steps proposed by Aguinis et al. (2018).

Figure 3.3 Simplified process for the literature review



Source: Adapted from Aguinis et al. (2018)

Step 1: Goal and scope of the review: Goal and scope of the literature review, as outlined before, was to assess the general concepts of sustainable tourism development and measurement of sustainable tourism underlying the model design and, in a second step, to identify missing concepts or links in existing assessment models that need to be addressed through the new proposed conceptual solution. This is done by analysing historical and contemporary definitions for sustainable tourism, as well as existing

assessment models, the concept of maturity models and smart tourism and ICT in the context of sustainable tourism.

Step 2: Procedure to select journals: Scopus, b-on, Google and Google Scholar were used as comprehensive databases to retrieve articles from relevant publications across different domains. To include tourism sustainability assessment models that have been developed and published by influential institutions, such as the UNWTO, the used sources comprise both scientific and non-scientific sources, such as websites.

Step 3: Source selection process: In order to identify articles for the research domain, keywords such as *sustainable tourism, maturity assessment, maturity model, sustainability maturity model* and *smart tourism* were used. Articles that include the keywords in either title, keywords or abstract were selected for the review. Another search filter included the publication period of January 2004 to December 2022.

Step 4: Selection of sources: Articles were checked for further review based on the perceived relevance for the defined research scope, resulting in the final set for the content extraction and analysis. Publications not related to the research scope, as well as publications not written in English were excluded.

Step 5: Content extraction process: In the last step, publications were reviewed to assess their contribution to the research on concepts of sustainable tourism development and measurement of sustainable tourism. In addition, an in-depth analysis of existing assessment models for sustainable tourism was conducted to identify relevant dimensions and sub-domains as well as missing concepts or links that need to be addressed in the subsequent design of the model. To identify existing assessment models as a sub-set of the general literature review, the following general criteria were applied:

1) The model needs to clearly state that it is measuring tourism destination sustainability.
2) Sufficient detailed information about indicators and underlying methodologies of the model had to be available online.
3) The model should be widely used and well-known.

For this step, publications related to the models were scrutinized in three stages, i.e. by title, abstract and full-text, meaning that the titles of the models were evaluated, the abstracts (if available) were thoroughly reviewed to ensure the model fits the desired

scope, and finally the full-text of each model was thoroughly reviewed using the inclusion and exclusion criteria. At each stage, publications which did not satisfy the above-mentioned criteria were excluded (Meade and Richardson, 1997). It needs to be noted that this screening was performed independently by the researcher. A total of four models was selected for further analysis based on this approach.

3.3.2 Semi-structured Interviews

As outlined before, qualitative interviews were conducted with a sample of experts and industry stakeholders with different perspectives on the field of sustainable tourism destinations in order to validate the proposed maturity assessment model. In total four industry stakeholders and ten tourism experts were invited. The final interviews involved five tourism experts and stakeholders from the University of Algarve as well as different tourism entities of the Algarve: Algarve Regional Coordination and Development Comission (*Comissão de Coordenação e Desenvolvimento Regional do Algarve*), Algarve Tourism Board (*Região de Turismo do Algarve*) and Algarve Tourism Bureau (*Associação de Turismo do Algarve*). The interviews were held face-to-face or virtually via Zoom in a timeframe of 1-1.5 hours.

Prior to the individual interviews, participants were provided with a pre-read in order to familiarize themselves with the background and design of the maturity assessment model. The focus interviews itself were set-up in two parts. The first part included an introduction of the participants, incl. the name of their organization/ institution, their field of expertise or position in the organization and their experience level with the subject of sustainable tourism/ sustainability assessments. This introduction was followed by a presentation of the author and the maturity model, by means of a Power Point presentation (see Appendix A). In the second part of each session a semi-structured interview guide (see Appendix B) was used to gather participants feedback on the model across the categories *Simplicity, Coverage and Completeness, Usefulness* and *Implementation.* As noted before, goal of the validation stage is to evaluate the quality of the design process and the resulting product. As design artifacts are generally supposed to be innovative and useful, they should be especially evaluated *"with respect to the utility provided for the class of problems addressed"* (Hevner et al. 2004, 77). The four defined categories frame the validation of the model as follows:

Simplicity

Is the model designed in such a way that is it clearly and easily understood?

Coverage and Completeness

Does the model adequately address all relevant dimensions of sustainable tourism and their sub-domains? Does the model adequately delineate the maturity levels and are the maturity level descriptions clear and complete? Does the model adequately address all tourism sub-sectors and all different stakeholders in a tourism destination? Does the model apply to all types of tourism destinations?

Usefulness

Is the model perceived as usefulness for tourism practitioners with regard to sustainable management of a destination? Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination? What are the main strengths of the model and how does it stand out in comparison to other existing models for measuring sustainability in tourism destinations?

Implementation

What could be the main difficulties, risks or success factors in the implementation of model from the point of view of practitioners? What could be appropriate methods to overcome the identified implementation difficulties and risks?

Background information on the participants in the interviews is summarized in Table 3.2. As Kurz et al. (2007) state, the number of necessary interviews in qualitative interviews cannot be quantified, as this variable is experience-based and varies depending on the respective research field and objectives. Additionally, the willingness and availability of interviewees within the given time frame can influence the number if required interviews (Glaeser and Laudel, 2010). Due to limited availabilities at the time of the validation period, a final number of five participants was achieved. It can be noted that a saturation with regards to three of the four assessed dimension was achieved in these interviews, where redundancy signalled that data collection was ceasing. For the dimension *Coverage and Completeness,* relevant insights were achieved, however a larger sample would be required to truly assess common themes and similarities in the interviewee's replies, as highlighted in the limitations of the study in Chapter 6.1.

Table 3.3 Background information on experts and tourism stakeholders

Participant	Profession	Entity	Position
1	Tourism Stakeholder	Região de Turismo do Algarve (ATB)	Director of Operations
2	Tourism Stakeholder	Comissão de Coordenação e Desenvolvimento Regional do Algarve (CCDR)	Member of the steering committee of the Algarve 2030 program management authority
3	Tourism Stakeholder	Agência Regional de Promoção Turística do Algarve (ATA)	Executive Director
4	Tourism Expert	University of Algarve	Full-time professor (focus: Sustainable Tourism)
5	Tourism Expert	University of Algarve	Full-time professor (focus: Regional and Urban Economics)

Source: Own elaboration by the author

For each of the sessions, a synopsis of the interview results was done (see Appendix G). In the following, a content analysis was applied as an objective approach to analyse and summarize the data and identify similarities and differences in the participants' feedback (Krippendorff, 2004). The interviews held in the validation stage can be described as confirmatory or feedback-oriented in nature, because they were aimed at evaluating a given tool (Warnecke et al., 2019). However, experts were asked to provide suggestions for improvement and constructive criticism to inform potential needs for further refinement of the model in the future.

Finally, additional qualitative information gathered during the interviews (e.g. regarding potential risks and challenges for implementation) was used to inform the development of recommendations for the practical application (Chapter 5.2) and to identify potential directions for future research and further development of the model, outlined in Chapter 6.

4 RESULTS: DESIGNING THE MODEL

The first part of the dissertation provided the methodological framework for the study and reviewed various aspects of the existing literature related to sustainable tourism destinations and the measurement of sustainable tourism to form the problem awareness. Existing assessment models were reviewed in more detail, along with the reflections of digitalization in the assessment of sustainable tourism and the use of maturity models in the same context. The objective of the current chapter is to unite the different concepts in order to derive a conceptual model for the assessment of sustainable tourism that is comprehensive, up-to-date and accounts for the potentials of digitalization. As outlined in the literature review, there are a number of criticisms of existing assessment models for sustainable tourism that need to be addressed in the design of the conceptual model. Accordingly, the first section of this Chapter picks up on the relevance of including aspects of digitalization in the assessment of tourism sustainability and the application of maturity models. The following sections then detail out how the suggested maturity assessment model for sustainable tourism can be developed, before Chapter 5 turns towards the validation and recommendations for practical implementation of the model.

4.1 Conceptual Solution for Measuring Tourism Sustainability

As seen in the reviews of various literature in Chapter 2, there is extensive research on the topic of sustainable tourism destinations and the relevance of measuring and monitoring. Different methods, such as indicator models, have been developed to assess the sustainability if tourism destinations. However, it has been seen that existing models provide a high level of complexity and ambiguity within a narrow focus and hence lack the clarity needed regarding implementation, deduction of management actions and communication.

Therefore, it could be inferred that a comprehensive, up-to-date model for the assessment of sustainability in tourism needs to address these gaps and extend the existing methods in order to provide true value for tourism practitioners. Hence, an extension of the methodology of indicator models and the inclusion of digitalization aspects is to be considered. The researcher’s experience in the context of management consulting inspired the suggestion to use the concept of maturity models as basis to enhance existing framework and develop the conceptual model which is the proposed outcome of the

dissertation's research project. With this combined approach, the conceptual model aims to address gaps of current indicator models in the following ways:

Model Complexity and Alignment of Indicators

Existing indicator models hold and abundance of individual metrics that are often not aligned and reflect different levels of granularity, leaving practitioners with too many choices. The model design should therefore achieve an appropriate balance between the complexities of reality and model simplicity in order to provide sufficient meaningful information for practitioners while limiting the potential for confusion or incorrect application of the model (De Bruin et al., 2005). To avoid biases in the model resulting from unaligned indicators, sub-domains should be clustered to follow a similar hierarchy and adequate granularity and be clearly described and delineated.

Scope of the Model

The existing models, in combination, display a broad spectrum of dimension that are relevant for an assessment of sustainability in tourism. However, the models fail to include a perspective on digitalization and its relevance for sustainable tourism development. The suggested conceptual model should therefore provide an extended scope to clearly display potentials of the application of smart technologies across the different dimensions of sustainability. The application of the maturity model concept should hereby help to delineate different levels of technological integration to suggest an evolutionary path for tourism destinations.

"Benchmarking" and Targets

The lack of benchmarks, thresholds or targets is being criticized for existing indicator models as it hinders practical application and usability of the models. Even when benchmarks are available, they provide only a snapshot view and lack contextual information on how to achieve these values or where to grow from there. The conceptual model should therefore be designed in a way to give clear indications on aspirable targets and development paths to achieve a desired state. Using a maturity model concept allows for the depiction of a continuum of target states, that can help practitioners to identify relevant transition points and change factors the need to be managed in order to effectively develop through these states (Solli-Sæther and Gottschalk, 2010).

Guidance for Implementation

Few of the existing assessment models for sustainable tourism outline clear indications for the implementation in practice. As noted before, the tourism sector is shaped by a large number of different stakeholders with different perspectives and priorities that need to be aligned under a common vision in order to effectively drive change with regards to sustainability. The designed model should therefore build on existing practices to elaborate concrete recommendations for its implementation in practice and be accompanied by concrete implications of the model for tourism agencies and policy-making.

Displaying and Communicating Data

Existing assessment models for sustainable tourism have not put a specific emphasis on a graphical representation of results. As has been noted, such visualization is seen as valuable for external communication as it allows for intuitive interpretation of results from different stakeholder groups (White et al., 2006). The proposed model should hence include a graphical representation of the assessment that can be leveraged for different communication purposes. The maturity model concept leans itself well for this purpose, as it allows to compare and document current maturity states, target states and resulting developmental gaps across a range of different dimensions in one graphical overview, e.g. using a radar chart. These visualizations can be adjusted regarding their level of detail to account for the needs of different stakeholder groups.

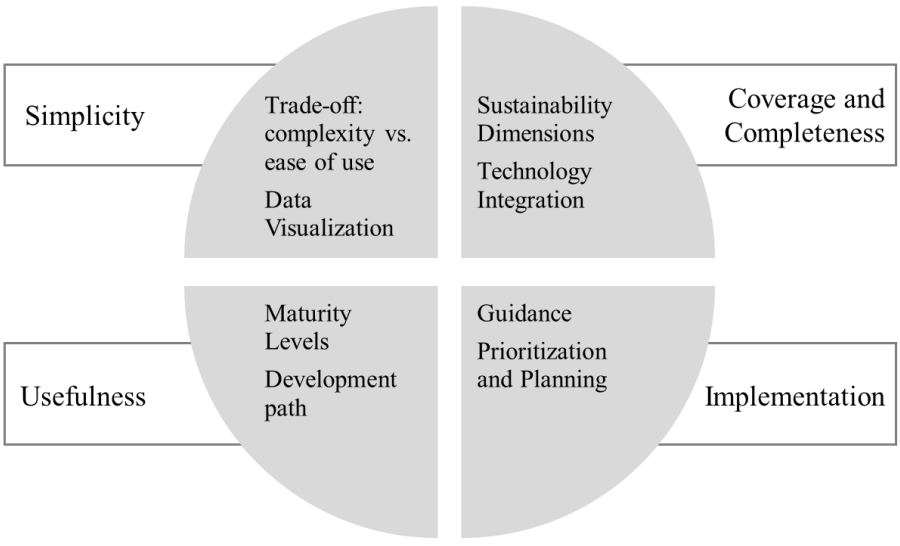
Translating Data into Action

As was seen from the literature review, current indicators models provide insufficient frameworks for the translation of their results into suitable management actions. The designed conceptual model aims at providing an operational tool for destination managers that can be applied in different stages of the planning cycle. Using the maturity model concept supports destinations in identifying which developmental stage they are currently in, using the characteristics that are defined for each maturity level. Based on this current positioning of the destination, the concept then helps managers to assess issues in upcoming development stages and, therefore, gives them a framework to develop and orchestrate their evolutionary journey (Solli-Sæther and Gottschalk 2010). The strength of the maturity model hereby lies especially in the fact

that, other than indicator models, it highlights the capabilities that need to be developed to achieve a higher maturity level and not only on the results of those actions in the form of metrics.

Following the review of how the proposed model should address existing gaps in assessment models for sustainable tourism, the objectives of the conceptual solution can be summarized as follows (Figure 4.1): To provide an operational tool for the assessment of tourism destinations with regards to sustainability, the dissertation seeks to develop a model that provides usefulness for tourism managers in the evaluation of the current and desired maturity levels of their destination and deduction of a potential development path. The model should thereby provide actionable guidance for destinations and allow for the prioritization and planning of measures to further develop their maturity level with regards to sustainability. While compiled from objective, research-funded indicators on all relevant dimensions for sustainable tourism under consideration of the integration of technology, the model should keep a balance between theoretical complexity and practical ease of use. Finally, the tool should include data visualization features in order to support the communication of assessment results and translation of assessment results into actions.

Figure 4.1 Overview of objectives for the proposed model



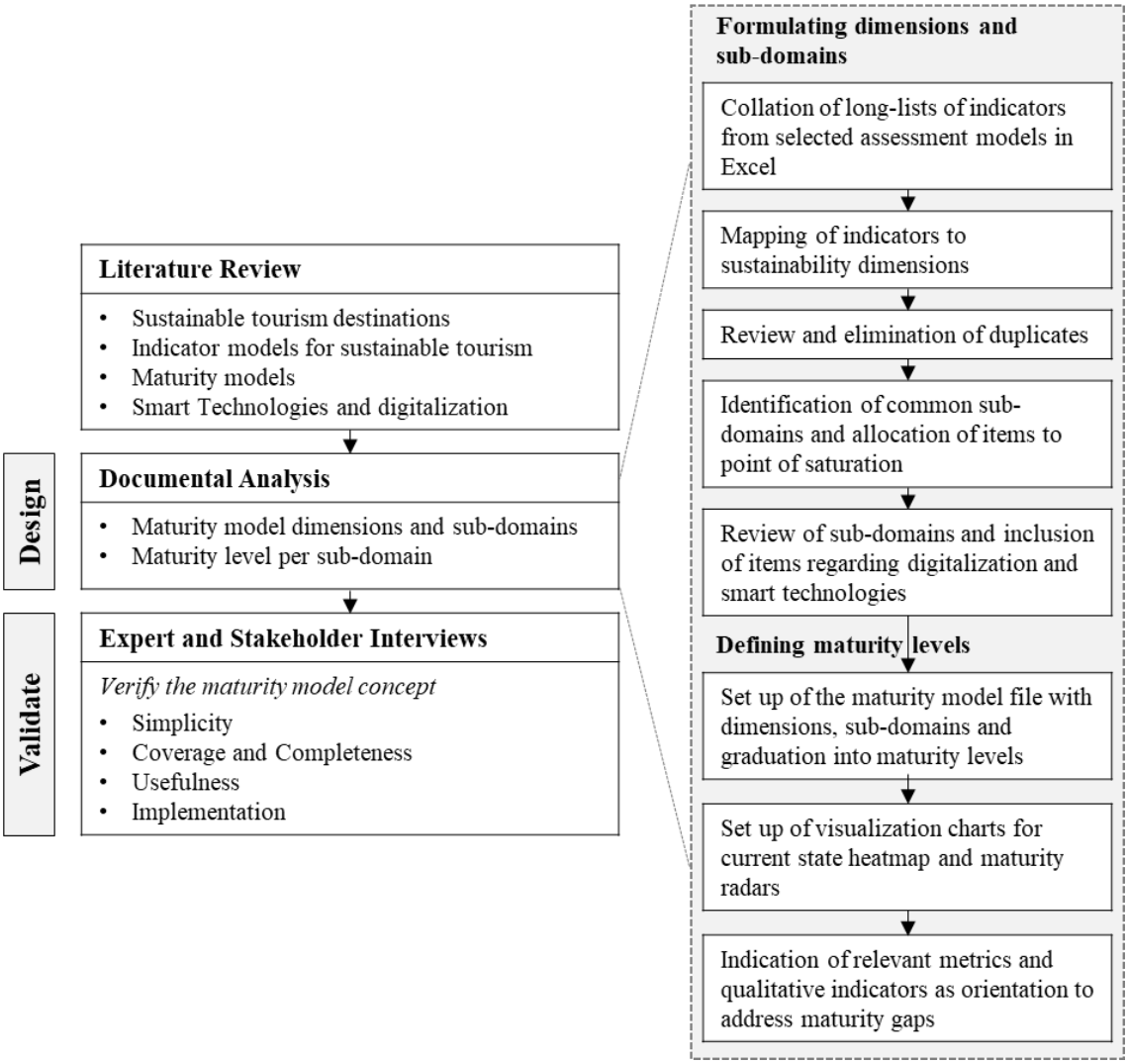
Source: Own elaboration by the author, inspired by Warnecke et al. (2019)

4.2 Formulating Maturity Model Dimensions and Sub-Domains

After the objectives for the design of the conceptual model have been set in the previous section, the purpose of this and the upcoming section is to detail the design of

the proposed Maturity Assessment Model for Sustainable Tourism. The procedural model of the design process can be seen in Figure 4.2. The design hereby consisted of two parts, first, formulating the maturity model dimensions and sub-domains and second, defining the maturity levels.

Figure 4.2 Development process for the sustainability maturity assessment



Source: Own elaboration by the author

In line with the approach suggested by Agyeiwaah et al. (2017), the initial formulation of the maturity model's dimensions and sub-domains was based on a thorough documental analysis of the existing tourism sustainability indicator models selected in Chapter 2.3.1. In a first step, all indicators and their related sub-domains identified from these models were collated in one long list in Excel. Next, the indicators were reviewed and mapped to the four sustainability dimensions identified in the literature review, i.e. an environmental, economic, socio-cultural and destination

management dimension. The long list of indicators in each dimension was then reviewed to first eliminate duplicates resulting from the synthesis of the different models. In a next step, common themes for the sub-domains of indicators per dimension were identified and updated as new items emerged from the analysis of the remaining models. Relevant indicators from the long list were hereby allocated to the identified sub-domains. This updating process continued until saturation, upon which new data categories were fit into existing ones (Agyeiwaah et al., 2017). For this exercise, items were clustered into common sub-domains, even though different terms might have been used to describe them in the different models. For example, the examination of the environmental dimension led to the identification of thematically close items from different sub-domains used by the other authors (i.e. related to *Air Pollution (UNWTO); Climate, Energy & Emissions (GDSI); Energy Management - Climate Change/ Mitigation (UNWTO)* and *GHG emissions and climate change mitigation (GSTC)*) which were upon close review and reflection clustered under the common unique sub-domain *Emissions* within of the environmental dimension.

To account for potential impacts of technology for the sustainable development of destinations, the defined dimensions and sub-domains were then cross-checked against the findings from the literature review in Chapter 2.3.2. and in particular the Smart Destination Indicator model defined by Ivars-Baidal et al. (2017, 2021a, 2021b). This model was developed for the regional network of Smart Destinations of the Region of Valencia, Spain (SDRV) to include indicators suitable to the Spanish Smart Destination model (DTI) from three angles: sustainable and competitive destination indicators, smart city indexes that were adjusted to the tourism context and third, self-developed indicators based on feedback from smart destination programmes developers and smart destinations literature, e.g. related to connectivity, the use of big data or provision of information (Ivars-Baidal et al., 2021a). The final set of indicators is aimed to allow Smart Destinations to self-assess their situation with regards to the dimensions Governance, Sustainability, Accessibility, Innovation, Connectivity, Intelligence, Information System, Online Marketing and Tourism Performance. As Ivars-Baidal et al. (2021a, 3) point out, the indicator model is thus supposed to serve as *"starting point for the detection of improvement areas and the identification of strategies and actions for each destination in each dimension [as key element in the planning process for smart tourism]"*. In 2021, the SDRV model had been deployed and completed by 18 destinations (i.e. Alcoi,

Alicante, Benidorm, Benicarló, Benicàssim, Calp, Campello, Cullera, Finestrat, Gandia, La Nucia, Morella, Penìscola, Santa Pola, Vila Joiosa, València, Villena, and Vinaròs), as the most advanced destinations with regards to smart destination plans and projects in the region of Valencia (Ivars-Baidal et al., 2021a). For the purpose of the model design in this dissertation, the SDRV indicator model serves as a good reference, as it is theoretically founded to provide a combined look into the dimensions of sustainability and smart technologies in the context of tourism, gives detailed information about the indicators and has been applied and validated in a range of different destinations. As the model encompasses both the *"traditional"* dimensions of destination sustainability as well as technology, the review allowed for a cross-check of the dimension, sub-domains and indicators already outlined in the Excel file as well as an expansion of the list with regards to aspects of technology. Following the review of the SDRV model, sub-domains or indicators emerging from the model that were not previously included in the list where either added as new items or fit into existing data categories within the dimensions. Where applicable, items from the SDRV model were split and fit into different sub-domains or dimensions in the Excel file. An example for that would be the item *"The destination has implemented sensors for management and efficiency improvement (e.g. water supply system management, public transport and traffic, public lightening, waste collection, parking spaces, etc.)"* from the SDRV model (p.16), which was fit as separate indicators into the sub-domains *Water, Low impact transportation, Sewage and Solid waste* within the environmental dimension, *Seasonality* within the economic dimension and *Wellbeing of host communities* within the socio-cultural dimension.

Following the synthesis of dimensions and sub-domains of the model, the next section will give an overview of the subsequent gradation into different maturity level and description of qualitative or quantitative requirements and indicators that distinguish each level.

4.3 Defining Maturity Levels

As Solli-Sæther and Gottschalk (2010) point out, the first core topic to emerge in the design of maturity models is to decide on the number of stages or levels of the model. As the authors note further, this is followed by the identification of dominant concerns and related theoretical characteristics of each of these levels that finally lead to the depiction of a developmental path. As has been described before, a common design

principle of existing maturity models is to represent maturity as a number of cumulative stages, meaning higher stages build on the requirements of lower stages (De Bruin et al., 2005). The number of maturity levels applied in existing models usually range from three to six levels (Jin et al., 2014), while Solli-Sæther and Gottschalk (2010), after a review of existing multistage models in the context of information technology and systems management note that it appear that models with four stages have been proposed most frequently. As De Bruin and colleagues (2005: 4) point out, it is important than, independent of the chosen number, the final stages need to be *"distinct and well-defined"* by means of following a logical progression and giving clear labels and definitions which summarize major requirements and measures of the stage and detail out the aspects that are new to a higher stage and that were not included in lower stages. In the original Capability Maturity Model (CMM) from Paulk et al. (1993), which is aimed at assessing organizations' process maturity and has been used as baseline for the design of many other MMs (e.g. Alvarez et al., 2015; Santana et al., 2019; Sari et al., 2021), five maturity level are defined. The levels are delineated to specify evaluation criteria which are then applied to all critical abilities in the model. The overall progression of maturity levels of the CMM can be summarized as follows (Paulk et al., 1995 in Sari et al., 2021): In Level 1, the *"initial"* stage, organizations display unpredictable, poorly controlled and reactive processes. In Level 2, the *"managed"* stage, organizational processes are still often reactive and uncontrolled, however some high-level processes are mapped and executed, and there is some degree of consistency. In Level 3, the *"defined"* stage, organizations' processes are often proactive and all basic processes are defined with some degree of control. Organizations show concern about the storage of data and use of metrics to monitor processes. In Level 4, the *"quantitatively managed"* stage, organisations use process management tools that store consistent information. They also use metrics to control and monitor processes and measure the achievement of established goals. Finally, In Level 5, the *"optimised"* stage, building upon controlled and monitored processes, organizations mainly focus on further processes improvements and training of their staff.

As Sari et al. (2021) note, a higher number of maturity levels is usually chosen to explain certain levels of maturity more specifically, while a smaller number of levels usually is achieved by combining characteristics of several maturity levels into one. For the present dissertation, the levels of the proposed maturity model are inspired by Warnecke et al. (2019) but truncated to four levels. This is due to the consideration to

facilitate ease of by clearly distinguishable levels and to foster a clearer assessment by eliminating the risk of potential bias that could result from a scale with midpoint (Garland, 1991). The detailed descriptions of the overall maturity levels of the model can be found in Table 4.1.

Table 4.1 Overall levels of the developed maturity assessment model

Maturity Level	Description
1 - BASIC	Basic understanding of tourism impacts and sustainability requirements in the destination. No formalized approach to sustainable tourism development. ICT integration is limited.
2 - PROGRESSING	Principles of sustainable development are acknowledged. Basic initiatives towards sustainable tourism development have been implemented. Initial concepts for the integration of technology have been developed. Initial sustainability-related objectives have been documented and performance is measured.
3 - ADVANCED	Sustainability impacts of tourism are being regularly measured and evaluated. Strategic planning and implementation of concepts to foster sustainable tourism development. Advanced integration of ICT to measure, analyse and publish relevant data and information to tourism stakeholders. Active stakeholder engagement in the development of plans, regulations and activities. Stakeholder feedback is used for continuous improvement of the tourism experience and DMO operations.
4 - LEADING	Sustainability as major guiding principle for tourism development in the destination. Continuous planning for sustainable tourism development takes place based on real-time data, advanced analytics, and the integration of all stakeholders through active knowledge exchange. DMO focuses on driving the further development of the destination's sustainability strategy through continuous performance management and active support and information for all tourism stakeholders.

Source: Own elaboration by the author

In Level 1, the *"basic"* stage, there is a basic understanding of tourism impacts and sustainability requirements in the destination, however no formalized approach to sustainable tourism development has been implemented and ICT integration is limited. In Level 2, the *"progressing"* stage, principles of sustainable development are acknowledged in the destination and basic initiatives towards sustainable tourism development have been implemented. In addition, initial concepts for the integration of technology have been developed, initial sustainability-related objectives have been

documented and performance is measured. In Level 3, the *"advanced"* stage, sustainability impacts of tourism are being regularly measured and evaluated and there is strategic planning in place to implement concepts for sustainable tourism development. In addition, there is an advanced integration of ICT to measure, analyze and publish relevant data and information to tourism stakeholders and stakeholders are active engaged in the development of plans, regulations and activities. Stakeholder feedback is used for continuous improvement of the tourism experience and DMO operations. Finally, in Level 4, the *"leading"* stage, sustainability is a major guiding principle for tourism development in the destination and a continuous planning for sustainable tourism development takes place based on real-time data, advanced analytics, and the integration of all stakeholders through active knowledge exchange. On this level, a DMO focuses on driving the further development of the destination's sustainability strategy through continuous performance management and active support and information for all tourism stakeholders.

Based on these common characteristics, the synthesized list of dimensions and sub-domains described in Chapter 4.2. was extended through the addition of the four maturity levels and specification of evaluation criteria on each level for each sub-domain of the model. The example of the sub-domain *Landscape and biodiversity protection – Management of natural sites* within the environmental dimension is shown in Table 4.2. In Level 1, the *"basic"* stage, there is no structured system for the management of visitors at natural sites in place, no management of monitoring of visitor flows, and different approaches to visitor management exist by various tour operators and tour guides. In Level 2, the *"progressing"* stage, some basic guidelines for visitor management at natural sites exist, but compliance with guidelines is not monitored. Visitor flows are monitored only on an ad hoc basis and there is no specific guidance for visitors regarding their visit at the natural site. In Level 3, the *"advanced"* stage, a system is in place for the visitor management within and around natural sites and visitor flows are monitored manually. In addition, guidelines for tour operators and guides are in place and enforced and there is substantial commitment from local enterprises to support protection and management of natural sites, e.g. by providing guidelines on visitor behaviour. In this stage, there is also evidence that income from tourism is used for protection, restoration and conservation of natural assets on a case-by-case basis. In Level 4, the *"leading"* stage, the destination has a holistic visitor management in place for natural sites, which takes account of their

characteristics, capacity and sensitivity and seeks to optimize visitor flow and minimize adverse impacts. This stage also shows evidence for ICT integration, such as the use of sensors to continuously monitor visitor flows and to initiate mitigating actions, if needed or dynamic online maps for visitors. The active integration of all stakeholders is evident in this stage through visitor behaviour guidelines that are made available to before and at the time of the visit and a code of practice or trainings that are provided for tour operators and tour guides, resulting in a large percentage of local enterprises that actively support the protection, conservation and management of natural sites. Finally, in this stage, there are mechanisms in place to regularly use income from tourism for protection, restoration and conservation of natural assets.

Table 4.2 Exemplary maturity levels for sub-domain

	Maturity Levels			
Sub-domain	1 - BASIC	2 - ROGRESSING	3 - ADVANCED	4 - LEADING
Landscape and biodiversity protection – *Management of natural sites*	No structured system for the management of visitors at natural sites in place. Visitor flows are not being monitored or managed. Tour operators and tour guides have different approaches to visitor management.	Basic guidelines for management of visitor at natural sites exist for tour operators and guides, but compliance with guidelines is not monitored. Visitor flows are monitored on an ad hoc basis. Visitors do not receive any specific guidance for their visit at the natural site.	System is in place for the management of visitors within and around natural sites. Visitor flows are monitored manually. Guidelines for tour operators and guides are in place and being enforces. There is substantial commitment from local enterprises to support protection and management of natural sites. Some tour operators/ tour guides provide guidelines on visitor behaviour. Income from tourism is used for protection, restoration and conservation of natural assets on a case-by-case basis.	The destination has a system for the management of visitors within and around natural sites, which takes account of their characteristics, capacity and sensitivity and seeks to optimize visitor flow and minimize adverse impacts. Sensors are used to continuously monitor visitor flows and to initiate mitigating actions, if needed. Tourist sites are geolocated in a dynamic online map for visitors to consult. Guidelines for visitor behaviour at sensitive sites are made available to visitors before and at the time of the visit. A code of practice/ trainings are provided for tour operators and tour guides on visitor management at natural sites. A large percentage of local enterprises in the tourism sector are actively supporting protection, conservation and management of natural sites. There are mechanisms in place to use income from tourism for protection, restoration and conservation of natural assets.

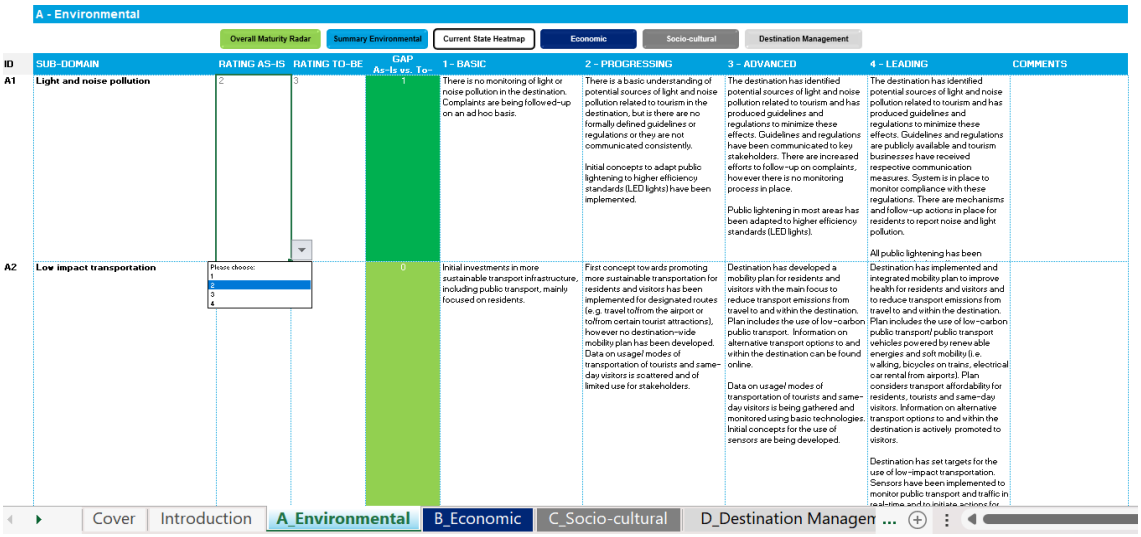
Source: Own elaboration by the author

The entire output of the detailing process of the maturity levels for each sub-domain can be found in Appendix E.

4.4 Summary of the Maturity Assessment Model for Sustainable Tourism

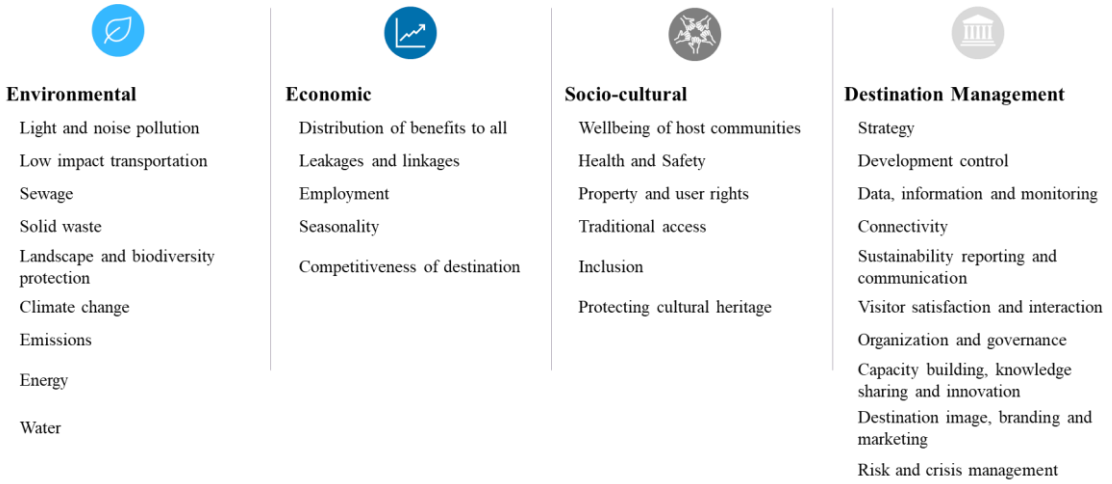
The resulting maturity assessment model for sustainable tourism uses a matrix-type layout in which the matrix is based on the maturity domains and levels (Figure 4.3). The matrix describes the characteristics and indicators that determine the criteria for each maturity level per sub-domain. The proposed maturity assessment model includes 4 sustainability dimensions and 30 sub-domains (see Figure 4.4).

Figure 4.3 Matrix-type maturity model



Source: Own elaboration by the author

Figure 4.4 Overview of maturity model dimensions and sub-domains



Source: Own elaboration by the author

Environmental Dimension

9 sub-domains – includes the sustainability measures of a destination to mitigate the environmental impacts of tourism, such as regarding the protection of landscape and biodiversity, provision of low impact transportation, management of sewage, solid waste, energy, water and light and noise pollution, as well as actions to tackle the impacts of climate change and monitoring and reducing emissions.

Economic Dimension

5 sub-domains – addresses the sustainability commitment and maturity of a destination with the regards to the equal distribution of benefits to all, managing economic leakages and linkages and impacts of seasonality, creating quality employment and driving destination competitiveness.

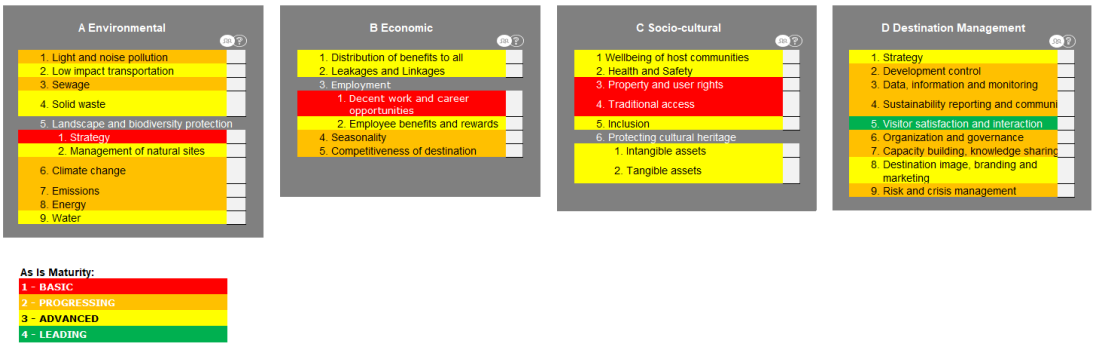
Socio-Cultural Dimension

6 sub-domains – focuses on the destination's developmental stage regarding policies and programs to ensure the wellbeing of host communities, care for health and safety of tourists and residents, respect property and user rights and protect traditional access for the local communities, foster inclusion and accessibility and protect tangible and intangible cultural heritage.

Destination Management Dimension

10 sub-domains – indicates the destination management organization's or related local authorities' commitment to sustainable development as part of strategy, development control mechanisms and reporting and communication, the maturity of their own organization and governance structures, the level and use of digital infrastructure with regards to connectivity, data, information and monitoring, management of visitor satisfaction and visitor interaction, their capabilities to build capacities, foster knowledge sharing innovation including different stakeholders groups, and finally their maturity level in terms of destination image, branding and marketing and risk and crisis management.

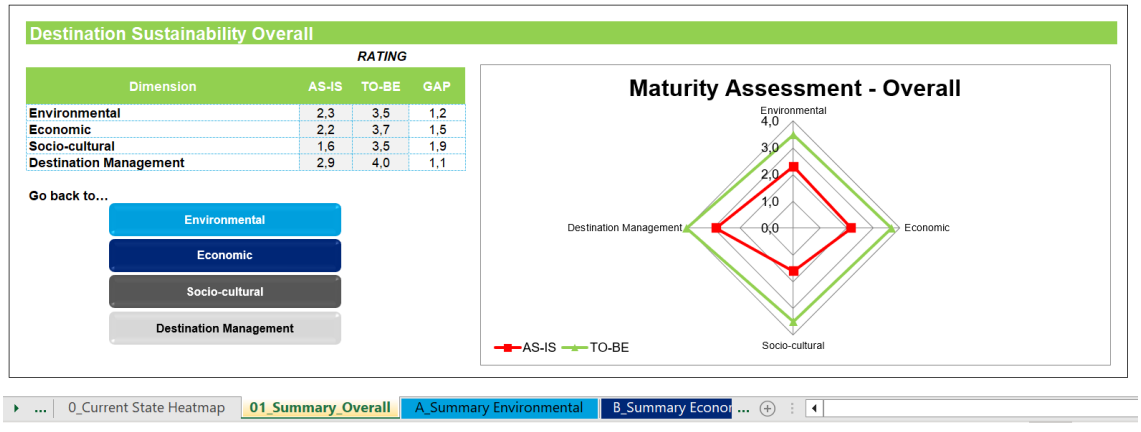
Figure 4.5 Maturity assessment output: Current state heatmap



Source: Own elaboration by the author

The conceptual model has been developed in Excel (for the cover and introduction page of the assessment tool see Appendix C and D). In the input matrices, drop down menus in each sub-domain enable to process the rating of as-is and desired to-be maturity levels on a scale from 1 – *"basic"* to 4 – *"leading"*. The results from this maturity assessment are provided in the form of a graphical analysis. As illustrated in Figure 4.5 a heat map chart provides a graphical representation of the as-is maturity level across all dimensions and sub-domains. The color coding from red (*"basic"* level) to green (*"leading"* level) gives a simple overview of the differences in maturity across sub-domains in the current state and helps to easily identify the most burning platforms with lowest maturity ratings at present.

Figure 4.6 Maturity assessment output: Overall maturity radar

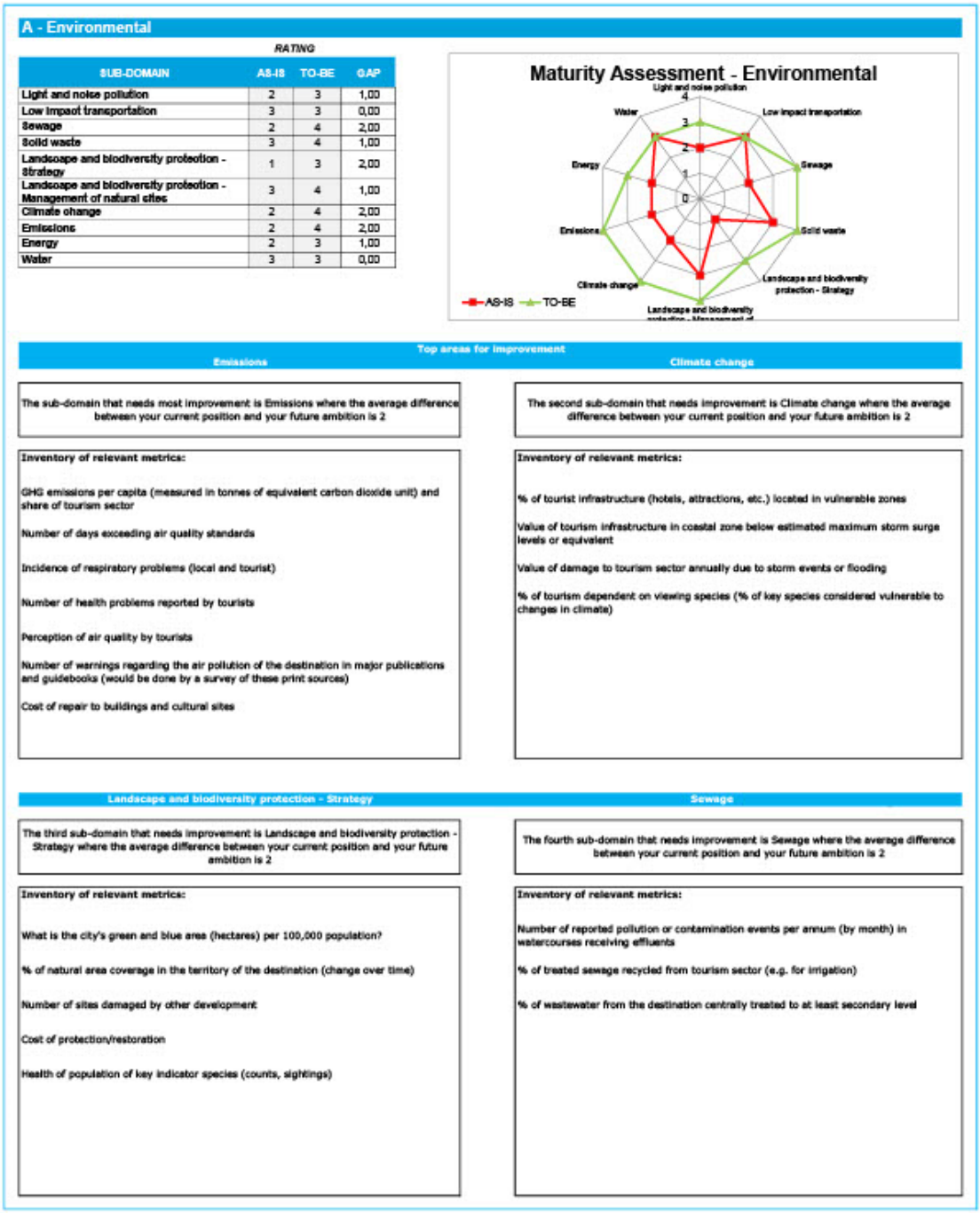


Source: Own elaboration by the author

In addition, the Excel tool displays the combined results of the assessment of current and desired maturity in the form of radar charts. Figure 4.6 shows the output for the overall maturity assessment, summarizing the average maturity level for each

dimension on the basis of the sub-domain results. The radar chart hereby shows the as-is maturity state of the destination (red) and the desired to-be maturity state (green). The table on the left displays the maturity level and gap in each dimension in absolute numbers. The developed model hence allows destination to assess their maturity level and compare results across the four dimensions of sustainability easily and intuitively.

Figure 4.7 Maturity assessment output: Detailed maturity results per dimension



Source: Own elaboration by the author

For a more detailed view, radar charts are also provided on a dimension level, as shown in Figure 4.7 on the example of the environmental dimension. For all result visualization outputs of the model see Appendix F, which is based on exemplary ratings for illustration purposes. The detailed maturity rating view per dimension shows a more detailed assessment of current and desired maturity levels and resulting gaps in each sub-domain, both graphically and numerically. To provide practitioners with actionable guidance, sub-domains with the numerically highest gaps between current and desired maturity level are listed as *"Top areas for improvement"* below the radar chart and complemented by an inventory of relevant metrics as a reference for the design of measures to address these maturity gaps.

The final proposed maturity assessment model hence allows an assessment of sustainability for tourism destinations across all relevant dimension and under consideration of digitalization aspects. Based on a clear design and result displays, the model aims to give actionable insights to practitioners on current maturity states and desired developmental targets and relevant metrics for the implementation of measures to close existing maturity gaps. This way, the model can serve as a supporting tool for the definition of priorities in the destination and also enable the communication of results to different stakeholder groups.

In the next section, the model will be validated through interviews with experts and stakeholders in the tourism field. Following this verification, the model design will be concluded with recommendation for a successful implementation of the model in a destination and relevant considerations for use by tourism practitioners.

5 MODEL VALIDATION AND DISCUSSION OF RESULTS

As described in Chapter 3, the designed maturity assessment model was validated through the collection of qualitative feedback from tourism stakeholders and experts. The outcomes of this process are described in the next section and used as basis for the subsequent sections that outline a proposed implementation process for the model in a destination and give some considerations for use of the model by tourism practitioners.

5.1 Verifying the Proposed Model

Chapter 4 outlines how the proposed maturity assessment model aims to address common challenges of existing assessment models for sustainable tourism destinations, namely *Model Complexity and Alignment of Indicators; Scope of the Model; "Benchmarking" and Targets; Guidance for Implementation; Displaying and Communicating Data* and *Translating Data into Action*. This Chapter evaluates how the proposed model contributes to resolving these challenges, by grouping them into the four general dimensions *Simplicity, Coverage and Completeness, Usefulness* and *Implementation.* Table 5.1 condenses the evaluation results and suggestions for further improvement of the model based on the semi-structured interviews with five experts from the tourism sphere.

In terms of *Coverage and Completeness,* all experts and tourism stakeholders agreed that the model covers the relevant scope of sustainable tourism for all different types of destinations and shows alignment with international sustainability agendas, such as in the context EU regulations. The separation of the Destination Management dimensions, instead of its inclusion as a transversal aspect in the other dimensions, was specifically supported by three interviewees, pointing out that this puts the required emphasis and focus on the governance and management of destinations. All experts and tourism stakeholders agreed that the inclusion of the technology as a transversal factor was highly relevant and a critical element for the development of destination capabilities nowadays. The maturity levels were supported by all interviewees to depict a clearly delineated and adequate developmental path for destinations. Feedback regarding the development of a glossary for the sub-domains that summarize descriptions and related metrics has been taken up as a potential to further improve the model and customize its presentation towards different stakeholder groups (e.g. the general public, policy-makers, etc.). In two interviewees, the potential of adding a maturity level "zero" for tourism

destinations in an infant stage was brought up, however the experts and stakeholders concluded that this would not lead to a substantial value add for the model. In a future application of the model in different destinations, the proposed maturity levels will hence have to be tested against real use cases, so that they can be refined or expanded, if needed. While there were individual feedbacks regarding important aspects to highlight in different sub-domains of the model, the limited sample size did not allow to progress from individual opinions to common themes. Future, more extensive validations of the model with a larger sample of interviewees need to build on these individual findings to refine and amend the characteristics of the maturity levels for each sub-domain.

Regarding the *Usefulness* of the model, all experts and tourism stakeholders evaluated the model as a very useful operational tool for the management of tourism destination, especially with regards to planning and evaluation. The exploration of the application of a maturity model concept to the field of sustainable tourism was considered a new approach with huge potential, both viewed from an industry and academic perspective. Especially the dynamic approach of the maturity model was perceived as helpful for destinations to understand that critical perspectives across all dimensions of sustainability need to be developed in order to progress to a "leading" stage, instead of merely focusing on economic growth and disregarding the requirements of other dimensions. For practical application, interviewees highlighted that the model allows to re-adapt and continuously develop destination targets and specifically enables a critical evaluation and definition of priorities, which was mentioned as extremely relevant factor for destination with limited resources, such as the Algarve. In this context, a potential link of the model to national or supra-national funding programs and priority topics was suggested, which can be evaluated for a potential future extension of the model.

Finally, experts and tourism stakeholders were asked to give feedback on assumed challenges and risks for the *Implementation* of the model and success factors or measures to overcome these. As a primary point, all of the interviewees were concerned with the availability and quality of data relevant for the maturity assessment, as well as the cost related to acquiring it. As is the case in for the destination of Algarve nowadays, data often comes from scattered sources with different levels of segregation (municipal, regional, etc.) and aggregation that need to be synthesized and rationalized so that it provides true insights. While feedback suggesting a potential to link the maturity model

to existing sets of standardized indicators or international frameworks has been included in the directions for future research and policy recommendations and implications for tourism agencies at the end of the dissertation, it needs to be noted that concern should not provide a hindrance for the implementation of the maturity model. Other than indicator models which heavily rely on the availability of data, the maturity model merely assesses the destination's capability to leverage data for the assessment of each sub-domain. As a consequence, the unavailability or unreliability of data regarding a specific sub-domain can constitute a finding in itself. A quote often attributed to Peter Drucker says, *"you can't manage what you can't measure"*, hence the lack of data hints towards the prevalence of a lower maturity level for this particular sub-domain. Regarding the translation of assessment results into actions, some interviewees noted the potential to provide a *"portfolio of activities"* that is adapted to the destination's current and desired future maturity level in the different dimensions and sub-domains. Such a portfolio could help to establish a potential roadmap for destinations on the transformation towards sustainability. In combination with additional feedback on the potential inclusion of more detailed guidance which benchmarks can be applied for metrics around these activities, this presents an interesting feature for future developments of the maturity model which has therefore been taken up as a direction for future research. Next to the challenges and risks around the methodological aspects of the model, one important consideration that emerged from the interviews was the coordination and management of the model against the complex stakeholder landscape of tourism. In this people dimension, a potential resistance to change, lack of required mindset and lacking acceptance of the relevance of the model and its results, especially from policy-makers were perceived as major challenges for a successful implementation. While these concerns can not be solved with the model design itself, the feedback informs the development of recommendations for a practical implementation of the model, given in the next section. Here, potential steps for the application of the model are detailed out. A participatory approach, considering the success factors noted by the interviewees (such as change management and communication measures that highlight the objectives, benefits and opportunities of the model) is proposed in order to overcome this implementation challenge, create stakeholder engagement, trust and buy-in.

Table 5.1 Summary of feedbacks from stakeholders and tourism experts

Simplicity	***Coverage and Completeness***
▪ Model framework to be easily understood by different tourism stakeholders. ▪ Model contents clear and objective and reflecting reality. ▪ Model structure and alignment of sub-domains adequate to support the general applicability of the model. ▪ Graphical visualization of results important feature to provide clarity and focus on key points, especially as dealing with complex data. ▪ Simplicity of the model allows for an easy implementation for the exploration of the topic of sustainability in a participatory approach.	▪ Dimensions and sub-domains of the model cover the relevant scope of sustainable tourism and are aligned to international sustainability agendas. ▪ Separation of Destination Management dimension beneficial to achieve the required focus and attention. ▪ Technology as transversal factor with high importance for the development of destination capabilities. ▪ Maturity levels and delineation show clear and adequate development path. ▪ Model covers all tourism subsectors and addresses all different stakeholders. ▪ Applicability to different types of tourism destinations and tourism products given. ▪ Potential to add glossary with descriptions of sub-domains and related metrics, customized for target group. ▪ Potential to extend maturity scale to a level "zero" (for completely new tourism destinations); however no major perceived value add.
Usefulness	***Implementation***
▪ Model very useful as operational tool to support the planning cycle for tourism destination. ▪ Application of maturity model concept to the field of sustainable tourism considered a new approach with huge academic and practical potential. ▪ Dynamic maturity approach helps to understand what critical perspectives across the sustainability dimensions are needed on the developmental path. ▪ Model allows for re-adaptation and continuous development of destination targets ▪ Model enables critical evaluation and definition of priorities, which is an extremely relevant factor for destinations with limited resources. ▪ Potential to link model contents to national or supra-national funding programs to further support the definition of strategic priorities.	▪ Availability and cost of quality data for the assessment one of the biggest difficulties for implementation of the model ▪ Data might come from scattered sources, in different levels of segregation and quality and needs to be synthesized and rationalized. ▪ Due to complex stakeholder landscape in the tourism sector, appropriate coordination and management of the framework is needed for implementation. ▪ Risk lies in resistance to change, lack of required mindset and hence acceptance of the relevance of the model and its results from tourism stakeholders. ▪ Successful implementation requires change management and communication, pointing out objectives, benefits and opportunities of the model. ▪ Active engagement of stakeholders, creation of trust and transparency as key success factors. ▪ Regarding availability and harmonization of data, potential to link model to existing sets of standardized indicators or international frameworks, such as the Sustainable Development Goals. ▪ Potential to provide "portfolio of activities"/ transformation roadmap based on destination's results to support translation of model results into actions. ▪ Potential to include more detailed guidance regarding benchmarks of the suggested metrics.

Source: Own elaboration by the author

5.2 Practical Implementation of the Model

As can be seen from the validation of the model with tourism experts and stakeholders, described in the previous section, the proposed Maturity Assessment Model for Sustainable Tourism provides a sound theoretical tool for destination managers worldwide. However, as the feedback has shown, its ability to inspire change in a destination largely depend on a successfully managed implementation and engagement of stakeholders. In addition, tourism managers need to understand the mechanics and underlying assumptions of the model in order to truly leverage its potentials and achieve the best use for their destination. The following two sections therefore propose steps for an implementation of the maturity assessment model in a destination and finally give practical consideration of use as guidance for tourism practitioners.

5.2.1 Implementation Process

Conducting a thorough maturity assessment is not necessarily an instant process; depending on the availability and support level of stakeholders, the size and complexity of the destination and the existence of information on the current state, it may take from several days up to weeks or months. To provide practitioners with some guidance on the application of a maturity assessment, both the UNWTO Guidebook for Indicators of Sustainable Development for Tourism Destinations (2004) and the related, more "hands-on" Field Guide by Manning and Manning (last revision 2016) are used as main references. The guidelines on indicator development provide useful for the application of the proposed maturity assessment, as they relate to the same set of relevant stakeholders and rely on a similar process for the gathering of data to establish an as-is assessment and develop a future state. There are, however, significant differences between implementing tourism indicators and a conducting a maturity assessment, as will be outlined here.

A maturity assessment for sustainable tourism might be initiated by the local tourism authority or association itself, the destination government, or an organization of the community or other non-governmental or academic organization. In any case, it is recommended that the assessment will combine an internal perspective as well as external observations, in order to provide the relevant objectivity and accuracy that is needed to deduct the right results and actions (McKinsey, 2017). As the consultants note, the comparison of internal and external viewpoints and identification of potential differences, can drive valuable discussion. It needs to be noted, that the external evaluator does not

necessarily need to be “fully external”, as in the case of a consultant. The external perspective might as well be provided by a tourism expert from outside the region or a foreign destination who has experience with the industry and sustainability matters, as well as the maturity model and assessment procedure. As McKinsey (2017) note, it is typically helpful, if the external evaluator remains at least partially involved in the implementation of any subsequent actions, e.g. as an external advisor.

Similarly to a sustainable tourism indicator model, the maturity assessment can be introduced in different phases of a destination planning cycle (UNWTO, 2004). If there is no formal tourism strategy or plan in place, the maturity assessment can serve as an initial step to identify what is intended to sustain and trigger the development of policies and tourism planning that enables the destination to close existing gaps towards the desired maturity in different domains. If there is already a strategy or plan in place, a maturity assessment can help to review its fit to existing maturity gaps and desired maturity goals and to refine targets and reporting mechanisms for a successful monitoring and management of the destination’s developmental path.

Figure 5.1 Recommended steps for implementation of the maturity assessment model

Research and Organization	
Step 1:	Selection and Mobilization of Stakeholder
Step 2:	Delineation of the destination, its tourism assets and risks
Assessment Phase	
Step 3.	Defining the current state of the destination
Step 4:	Establishing a vision of the desired future state
Step 5:	Gap analysis and prioritization of sub-domains for development
Initiate Actions and Follow Up	
Step 6:	Translating priorities into actions
Step 7:	Communication
Step 8:	Monitoring and evaluation of results

Source: Own elaboration by the author

The suggested methodology for the application of the maturity assessment in a destination is a phased approach which results in a clear picture of current and desired future state of maturity. The methodology is based on a participatory approach, with the purpose to not only gain a complete picture but also to create awareness and engagement across different stakeholder groups. As is the case for the implementation of tourism indicators, the suggested maturity assessment process includes steps that are part of a

regular tourism planning process, such as the identification of tourism assets and risks (UNWTO, 2004). All recommended steps are shown in Figure 5.1 and are outlined below.

Starting phase: Research and Organization

The starting phase includes the analysis, selection and mobilization of stakeholders, as well as the collection of relevant information about the destination, its assets, conditions and concerns. Aim of this phase is to collect an inventory of data and expertise required to assess the current state of the destination and its tourism and to clarify the roles of the key stakeholders before initiating the maturity assessment.

Step 1: Selection and Mobilization of Stakeholder

Due to the aforementioned complexity of the tourism sector and the broad range of impacts it has on a destination, the involvement of stakeholders is key to assess the current state and define the desired future maturity level of a destination. Local knowledge can be critical and provide key information on local use of resources, traditions or values. In addition, local residents tend to hold clear ideas about the current state of the destination and how things would need to develop in the future (UNWTO, 2004). While the group of stakeholders to be involved should be rather extensive in the as-is assessment phase to identify current issues and risks, it is recommended to use a set of key stakeholders for the definition of the desired to-be maturity level, the prioritization of domains and deduction of fields for action. In line with UNWTO's (2004) recommendations, setting up a working group or committee, consisting of representatives from all key stakeholder groups, can add significant value from cross-sectoral expertise and provide continuity for the latter part of the assessment.

A list of potential stakeholders in tourism as destination level can be seen in Figure 5.2. To comprise the appropriate set of stakeholders for each of the assessment phases, it is recommended to conduct a stakeholder analysis, outlining the extend the different groups need and want to be involved in the project, the degree to which they are affected by tourism professionally and personally, their interests, general understanding of sustainability monitoring and their availability to participate in the project (UNWTO, 2004).

Table 5.3 Potential stakeholders in tourism at destination level

Sector	Stakeholder Groups
Communities	▪ Local community, native and cultural groups ▪ Traditional leaders ▪ Property and building owners ▪ Tenants
Public sector	▪ Municipal authorities ▪ Regional authorities (e.g., planning and conservation authorities, coastal zone and regional parks authorities) ▪ National and sub-national ministries responsible for tourism and its key assets ▪ Other ministries and agencies in areas affecting tourism (e.g. transport, natural resources, environment, culture, infrastructure, planning, health) ▪ Agencies with an interest in the planning or maintenance of specific attractions (e.g., parks, protected areas, museums, cultural sites and events)
Private sector	▪ Tour operators and travel agents ▪ Accommodation, restaurants and attractions, and their associations ▪ Transportation and other service providers ▪ Guides, interpreters and outfitters ▪ Suppliers to the industry ▪ Tourism and trade organizations ▪ Business development organizations
NGOs	▪ Environmental groups (in the destination and outside but with an interest) ▪ Conservation groups (e.g., wetlands, native species, parks, cultural heritage) ▪ Other interest groups (e.g., hunters, fishers, sports and adventure associations)
Tourists	▪ Organizations representing tourists' interests at the point(s) of origin ▪ International tourism bodies

Source: Adapted from UNWTO (2004)

Once the stakeholder analysis is completed, it is recommended to establish early contact with the local groups and those who are most likely affected by any changes in the tourism sphere. An initial forum or meeting can provide the opportunity to give context to the planned maturity assessment, explain the procedure and objectives. This format should give discussion opportunities and allow stakeholders to identify their interest and concerns and establish a culture of openness and transparency and create engagement in the project (UNWTO, 2004).

Step 2: Delineation of the destination, its tourism assets and risks

As the UNWTO (2004) notes, the definition of the destination, its geographical boundaries and political jurisdictions is a critical first step to any assessment. While the term destination has been officially defined, as noted earlier, this delineation can prove

complex in practice (UNWTO, 2004). Manning and Manning (2016) recommend matching the boundaries that are used by governments, e.g. for census areas, planning authorities, etc. and to reflect physical or ecological boundaries, e.g. river valley or islands in order to delineate all areas affected by tourism activity.

Once the boundaries of the destination are delineated, it is crucial to define the inventory of key tourism assets on which tourism is based in the destination, i.e. priority use areas for tourist as well as attractions (beaches, historical and natural sites, marketplaces, landscapes, wildlife, festivals, food, cultural experiences, etc.) (UNWTO, 2004). In line with the recommendation of UNWTO (2004), the perspective of local stakeholders should be included here (e.g. using interviews or site visits) to reveal all potentials of the destination and also understand the value these assets have for different stakeholder groups, such as the local community and current or potential tourists. Based on this perceived value, the assessment should further include research on existing plans or previous studies to obtain a view on sensitivity and current or future risks of the tourism assets. What is the current state of the assets? What are risk factors, such as impacts of climate change? How sensitive are the assets to changes in the external environment? What plans are in existence, e.g. on construction or other development projects, which may impact the state of the tourism assets or the limits of use in the destination? (Manning and Manning, 2016; UNWTO, 2004)

As basis for the subsequent maturity assessment, it is crucial to collect information about the current responses to risks and trends in the initial phase of the project. Is there a strategy, planning or regulation processes in place to address these risks and is there any measurement of results? What data sources and tools exist monitor risks and impacts? Which governance structures have been developed to drive a sustainable development of the destination? How is tourism planning integrated with plans and actions of other sectors that share resources or otherwise impact the tourism sector? This exercise might involve the collection of data from various different sources and in various degrees of formalization to provide a baseline for the definition of the current state and identification of maturity gaps.

Assessment Phase

Step 3: Defining the current state of the destination

As the UNWTO (2004) notes, there is a variety of different activities that can form part of participatory processes, such as workshops, focus groups, structured or semi-structured interviews, advisory panels, surveys or questionnaires. Depending on the size of the destination and its numbers of stakeholder, their availability and other logistical factors, different formats can be recommendable in the different stages of the maturity assessment. For the as-is assessment, a workshop approach is suggested, as inspired by the UNWTO participatory workshop approach for sustainability indicators development and training (2004). Aim of the workshop is to catalyze a shared view on the current state of the destination and to mobilize stakeholders and create commitment for a development of the destination towards a higher maturity level of sustainability. In the following, the recommended logistics of such a workshop are outlined:

1. **Site visits and presentations to familiarize participants with the current state.** In preparation of the workshop, the core project team needs to structure and synthesize all information gathered in the Organization and Research phase. Workshop facilitators or local experts should then present these findings about the destination's assets, current risks and already established measures to the workshop participants in order to create a common initial view on the as-is status of the different sustainability dimensions and sub-domains. Where needed, site visits can be conducted to gain a deeper understanding for the current state of e.g. environmental or socio-cultural aspects of the destination (UNWTO, 2004).
2. **Refinement and validation of as-is maturity level per dimension.** If the workshop group is larger large, the recommendation of Manning and Manning (2016) to create working groups of 8-12 people (e.g. one for each sustainability dimension) should be followed in order to refine and validate the assessment of the current maturity level. Each of the groups should be tasked with a thorough review of the findings for each sub-domain and validate the ratings of the maturity levels following the level descriptions. The cross-sector experience of the workshop participant should assist in the assessment of the various characteristics related to the different maturity levels in each sub-domain. Should information gaps or differences of opinion regarding the definition of the current state be detected, these need to be documented for discussion

and clarification. If time allows, working groups should rotate so that each group has covered all four dimensions once.

3. **Finalization of as-is maturity level of the destination.** The as-is maturity assessments from each of the working group should be presented in the plenary for discussion. Potential differences in opinion should be addressed and reconciled through discussion. Information gaps identified by the working group that have hindered the agreement on a maturity level should be addressed in the plenary discussion. Applying a consensus-based approach, a common agreement on the current maturity level for each sub-domain and hence sustainability dimension should be found and documented. Should it not be possible to close information gaps with the existing expertise in the workshop, a follow-up and more detailed research needs to be scheduled.
4. **Documentation of results.** The final as-is maturity ratings should be documented and provided to the workshop participants along with the maturity level descriptions, relevant comments or agreed follow-up actions.

In case a workshop approach as outlined above is not feasible in the destination, e.g. due to scheduling difficulties or geographical hurdles, or if some key stakeholders are not able to participate at the workshop date, an alternative option would be for the core project team to conduct smaller focus groups or focus interviews. In these sessions, a structured interview guide would be applied to gather the stakeholders' view on the current maturity level of the destination based on the previously defined destination's assets, current risks and already established measures. Following the focus group and interview sessions, all information would need to be synthesized and reviewed by the core project team and brought to the working team or committee for review and finalization of the as-is assessment.

As the UNWTO (2004) points out, the selection of the participatory process may also need to be adapted from culture to culture. In very hierarchical cultures where control is usually centralized, it might be advisable not to use an open participatory format, such as a workshop, but to use mixed formats (e.g. focus groups, interviews, surveys) to gather and synthesize the perspectives of all relevant stakeholder groups.

Step 4: Establishing a vision of the desired future state

Establishing a vision for the desired future state is the purpose of a second workshop day, which should take place in close sequence after the as-is workshop, either the following day or within a timespan of a few days. This is recommendable so that the discussions from the workshop are still fresh in the participants' mind to enable a fruitful discussion of the future state. Unlike in the first workshop, the target state workshop can be held in a smaller group of key stakeholders and needs to include decision-makers in the destination to facilitate efficient discussion. The suggested logistics of the second workshop are follows:

1. **Short recap of current state.** Depending on how much time has passed since the as-is workshop, the agreed upon current maturity levels should be presented briefly to refresh participants memories and prepare the following assessment of the desired future state.
2. **Introduce discussion of the desired future state.** If a future vision for the destination has already been established as part of a planning processes, it should be presented as baseline to discuss the implications for the desired future maturity state in each dimension. As Manning and Manning (2016) note, the review of an existing vision is also relevant to identify whether it is share by all stakeholders or whether differences of opinion exist that will have to be understood and harmonized. If no such vision exists yet, the workshop can directly move into step 3.
3. **Definition of desired future maturity level per dimension.** Similar to the first workshop, working groups of 8-12 people (e.g. one for each sustainability dimension) should be defined for the definition of the desired future maturity levels for each sub-domain, following the level descriptions. The broad expertise from the workshop participants should help to make a realistic assessment of what is feasible and desirable within the next 3-5 years in the destination. The definition of the desired future state should hereby especially consider current burning platforms (i.e. sub-domains with the currently lowest maturity levels), external risk factors and trends that might put additional pressure on the sustainability level of tourism assets within the reviewed timeframe and feasibility with regards to available budget and other resources in the destination. Differences of opinion or uncertainties about the rating

should be noted for further discussion. If time allows, working groups should rotate so that each group has covered all four dimensions once.

4. **Finalization of desired to-be maturity level of the destination.** The resulting to-be maturity levels from each of the working group should be presented in the plenary for discussion. Potential differences in opinion should be addressed and reconciled through discussion. Applying a consensus-based approach, a common agreement on the desired future maturity level for each sub-domain and hence sustainability dimension should be found and documented. Should there be any gaps in information that hinder the agreement on a maturity level and that cannot be reconciled in the plenary session (e.g. with regards to availability of resources or technological requirements) a follow-up or consultation with further stakeholders can be needed.
5. **Documentation of results.** The final to-be maturity ratings should be documented at the end of the workshop day by the core project team. These will form the basis for the analysis for existing maturity gaps and the further discussion on how to prioritize and close these gaps.

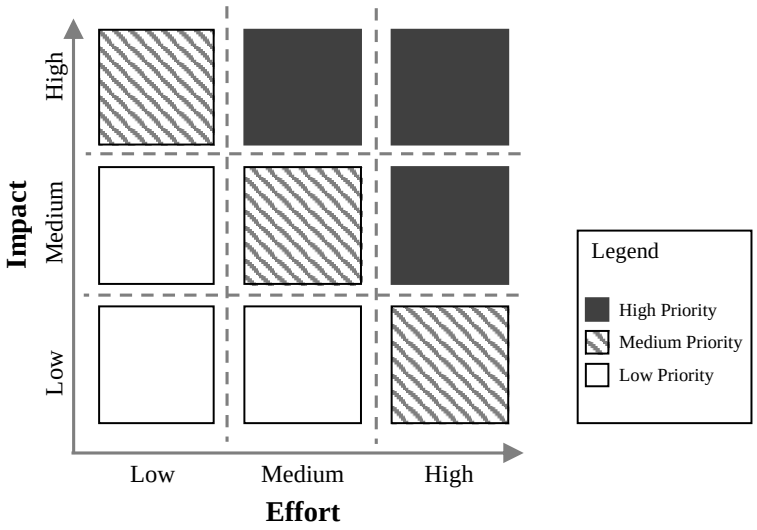
Step 5: Gap analysis and prioritization of sub-domains for development

Finalizing the data inputs in the maturity assessment tool based on the defined target states can be done right after the target state workshop. Ideally, the core project team can do this overnight, so that a second workshop day with the same participant group can directly follow that focuses on the review of the resulting maturity charts and existing gaps between the current situation and the target state. The results from the maturity assessment will not only show where the current burning platforms are, i.e. areas with the lowest maturity ratings in the current state, but also point out the sub-domains with the largest gaps between current and target state.

Agreement which maturity gaps and hence sub-domains to prioritize for further actions will not be a straightforward task. Most probably, different stakeholders will have their own perspective on which gaps need to be addressed most urgently, based on their individual backgrounds (Butler, 1999). Within the workshop, the group therefore might need to develop criteria for the prioritization, such as potential impact or value, related costs, effort, or ease of implementation, urgency (e.g. due to external risk factors or perception of tourists or residents). Setting up a matrix structure as exemplarily outlined in Figure 5.2 might help to identify which of the sub-domains needs to be in which order.

In addition to these criteria, any already established planning objectives for the destination should be considered to identify priorities resulting from the maturity assessment.

Figure 5.2 Prioritization matrix for maturity gaps assessment



Source: Own depiction, adapted from McKinsey (undated)

The participatory workshop format enables each participant to be actively guided through the problems of prioritization and work through the actual process of choosing which gaps are most important to be addressed to increase the overall maturity level of the destination with regards to sustainability. As the UNWTO (2004) points out, such a participatory process is equally as important as the results, as participants need to discuss the implications of existing maturity gaps, related risks, costs, resource needs, etc., thereby gaining a true understanding for potential compromises to be made in light of given resources. Much like the UNWTO notes for their workshop approach for the development of sustainability indicators, the suggested workshops here do not intend to replace a more thorough analysis of risks and underlying topics for each sub-domain, however, do to the broad range of expertise from the different stakeholders, they can serve as a rich source of information and stimulant for discussion and a catalyst for the implementation of actions based on the maturity assessment results.

Initiate Actions and Follow Up

Step 6: Translating priorities into actions

As noted before, a maturity assessment provides benefits, independent of whether a tourism plan already exists in a destination or not. If no plan exists prior to the assessment, the process of identifying key tourism assets, related risks and maturity state can serve as initial step for the development of a formal plan or planning process (UNWTO, 2005). The assessment and prioritization of maturity gaps can hereby help to identify which key elements need to be included in this plan and to design policies and concrete transformation measures for implementation. Based on the defined priorities, metrics or performance indicators can be selected to measure the success of these actions. This information will also help to decide whether any corrective actions might be needed in the future and serve as a tool for continuous monitoring (UNWTO, 2005). A set of such potential metrics for the largest gaps is suggested as part of the Maturity Summary Charts as reference for destination managers in the assessment tool.

If a plan already exists in a destination the results of the maturity assessment can help to evaluate whether the current plans cover all gaps identified and prioritized in the assessment. They can also help to assess whether already defined objectives regarding sustainable development cover all relevant aspects related to the achievement of the desired maturity stage and whether they have the right level of precision. If no monitoring process or performance metrics were defined for the objectives of the existing plan, the suggestions from the maturity assessment can help to sharpen the systems needed for a successful monitoring. The priorities resulting from the maturity assessment can thereby drive a higher level of precision for the existing development goals and targets or even trigger a reconsideration or redefinition of goals and targets if inconsistencies are being revealed (UNWTO, 2005).

Whether a maturity assessment is conducted in the absence of a tourism plan or as part of a process of continuous improvement, it is important that the activities resulting from the identified priorities relate to the overall goals and targets of tourism development in the destination (UNWTO, 2005).

Step 7: Communication

A maturity assessment can provide important insights for public information. Detected maturity gaps can lead to support from the public to implement relevant planning procedures and measures in order to protect and sustain the key assets and values in a destination (UNWTO, 2005)

The level of detail that is applied for public communication needs to be defined on a case-by-case basis, however, following the suggestions of Manning and Manning (2016) the following methods can be used to maintain momentum and support following a sustainability assessment:

- Feedback to the original participants. Once the maturity gaps are identified and prioritized, the interest of the original stakeholder group used in the assessment process should be maintained by providing them with regular feedback on the implemented follow-up actions, e.g. through a group meeting or individual conversations. As many of the stakeholders will be affected by the defined planning measures, such continuous communication can help for their buy-in and support.
- Report to the public. A compilation of all findings from the maturity assessment and the related procedures can be conducted in the form of a report or as part of the destinations' annual report. Announcements of the results can be done e.g. via the DMO website, ideally involving the network of participants and crediting everyone's engagement in this process.

Step 8: Monitoring and evaluation of results

Ideally, a maturity assessment should not be a one-off activity. Regular monitoring and evaluation of results of the implemented measures should be conducted to measure development and initiate corrective actions, if needed. This is also needed to review whether, e.g. external risks have changed that might influence the prioritization of topics. Participatory processes are again recommended for the regular monitoring to include all stakeholders' perspectives. It is recommended to repeat the maturity assessment every few years to review the maturity development against the defined target state and make further refinements with regards to priorities and actions.

5.2.2 Considerations for use

The previous section has given guidelines for a successful implementation of the model in a destination. While the implementation process described is rather straightforward, there are some key considerations that need to be understood by tourism practitioners in order to effectively apply and use the model.

First, as Buckley (2012, 535) notes, it needs to be acknowledged that *"both tourism and sustainability are changing more rapidly than the tourism industry adopts sustainability improvements"*, meaning that the maturity model design needs to constantly evolve in order to keep providing an effective assessment tool for sustainable tourism. As Normann Andersen et al. (2020, 264) point out in this context, maturity needs to be understood as *"a relative and dynamic concept with regard to both context and time"* that is *"the result of a continuous and ongoing process of adaptation to a changing landscape of economic, socio-cultural, politico-legal, and technological beliefs, objectives, and conditions".* Consequently, as the authors highlight further, practitioners need to take into consideration that *"what is "mature" today must not necessarily be "mature" tomorrow"* (p.264). The usefulness of the maturity model hence always depends on the practitioners and the specific context and point of time of application.

In addition, despite the fact that maturity models generally describe a linear progression path towards higher maturity, that does not mean that *"the more you do, the better it will be"* or, in other words, higher maturity must not be seen as *"a goal in itself"* (Bente et al.; 2012:135). As a key consideration for practitioners, not all destinations might aspire to reach the highest level of maturity in all sub-domains and dimensions and not all might need to. As Bente et al. (2012) point out, the potential benefits of reaching a higher maturity level need to always be put in perspective to the costs related to that endeavour. In addition, a lower level of maturity in some sub-domains might be fitting for one destination, if it this level is sufficient to meet the needs in the specific local context (IBM, undated). This also implies that comparisons with different destinations always need to consider the specific local context, as target settings and required levels of maturity might vary from destination to destination for good reason.

As a consequence, while the proposed maturity model is designed to be applicable for different types of destinations in different stages of development, these specific contexts need to be kept in mind and provide the relevant configuration mechanisms for

the application of the model. While the model in its proposed version applies an even weighting of all sub-domains, there might be cases in which a destination chooses to include, e.g. urgency in the sense of external risk factors, perception of tourists or residents either to inform the definition of target maturity states or as part of the prioritization process for existing maturity gaps.

Finally, the model in its proposed states ends with the suggestion of an inventory of relevant metrics for the design of measures to address potential maturity gaps. As these metrics are highly context and situation specific, the destination needs to evaluate which of these metrics are most useful in their specific case. Conditions of good indicators, such as relevance, measurability, cost efficiency, accessibility, reliability or ease of implementation, as summarized by Torres-Delgado & Saarinen (2014) or White et al. (2006) can provide relevant guidelines for the selection of appropriate and effective metrics for the destination.

6 CONCLUSION

Following a design science research approach, this dissertation set out to design a maturity assessment model for sustainable tourism on the basis of a literature review, the results of which were used to define the objectives of the model and to detail out its dimensions, sub-domains and maturity levels. The developed Excel tool assesses the sustainability of tourism destinations across four dimensions and related sub-domains and supplies different graphical visualizations of current and desired future maturity levels, resulting maturity gaps and priority areas for improvement, including potentially relevant metrics.

In addition to the proposed model, recommendations for the implementation and practical use are given. As Solli-Sæther and Gottschalk (2010) point out, the benefits of maturity models are generally two-fold: for practitioners, a maturity model can be seen as a map that helps to identify their past, current and future location; for researchers, maturity models represent a theory that can be explored and empirically validated as a foundation to create new knowledge and insights into phenomena of the application domain. The maturity model developed in this thesis can therefore be seen as an example of how knowledge can be transferred from an academic sphere to practical stakeholders (Warnecke et al., 2019). With the first maturity model of this scale developed in its domain, this dissertation and the developed conceptual solution demonstrate how methods and artifacts from different scientific backgrounds can be combined and leveraged to enhance decision-making and planning for sustainable tourism destinations.

The validation of the proposed conceptual model was conducted based on interviews with tourism experts and stakeholders, the finding of which also led to the emergence directions for future research and further development of the model as well as relevant policy recommendations and implications for tourism agencies, which will be outlined in the following closing sections of the dissertation.

6.1 Limitations and Directions for Future Research

This dissertation and the resulting conceptual solution have shown significant potential to address gaps in existing tourism assessment models; however, as with all studies, this one is not without limitations and hence highlights interesting directions for further research. To begin, the model design was based on a thorough analysis of four

existing sustainable indicator models. While these models were chosen based on a rigorous process, they likely do not summarize the whole cosmos of existing assessment models for sustainable tourism and hence the resulting synthesis of data categories of the designed solution must not be considered exhaustive. There is no doubt that other existing assessment models, such as Life Cycle Assessments, environmental audits or multi-criteria analyses could provide additional input for the further development of the model's dimensions, sub-domains and maturity level characteristics. Additionally, the adoption of a qualitative approach to the grouping and formulating of sustainability dimensions and sub-domains in this study has the inherent risk to introduce subjectivity, as identified by Roberts and Tribe (2008). Additional qualitative evaluations could be applied to measure potential positive or negative correlations between the different sub-domains and maturity level and enable a reformulation of the items to improve the measurement properties of the model (Ivars-Baidal et al., 2021b).

While the application of a maturity model concept is perceived as a valuable extension of existing models with great academic potential, it needs to be noted that this work has to a large extend been conceptual. In academic research, empirical testing of maturity models and the underlying assumption of maturity as a linear progression towards the better has so far been problematic (Becker et al., 2010; Solli-Sæther and Gottschalk, 2010). Due to the lacking empirical evidence, findings of current models can only be considered preliminary and tentative conclusions. Solli-Sæther and Gottschalk (2010) point out that, in contrast to a linear, predictable progression of maturity stages as *"tight, discrete packages of internal characteristics that develop in response to dominant problems"* (p.280), some researchers see maturity stages as more fluid, with overlapping aspects in adjacent stages. In this context, Becker et al. (2010) note different approaches for further investigation, such as the concept of path-dependency to explain causal relationships between the events that impact maturity over time or evolutionary theory to interpret maturity stages against the background of dynamics in the external environment. Accordingly, for the maturity model designed in this dissertation, a more longitudinal study would be required to empirically test the model and its maturity level in different types of destinations and achieve more conclusive results.

The developed maturity model explored an inclusion of technology as transversal aspect in the dimensions of sustainability, taking reference from existing literature on

smart tourism and smart destinations and specifically the Smart Destination Indicator model defined by Ivars-Baidal et al. (2017, 2021a, 2021b). To date, there is only very limited research around smart tourism assessment models which explicitly express links to sustainability, therefore it can be assumed that the data categories and information taken from this model likely does not constitute all relevant insights around the application of ICT for sustainable development. Again in this context, the designed solution must not be considered exhaustive and further developments of the model need to follow the advances in this specific research field to further inform the characteristics of different maturity levels regarding the application of technology across the different sub-domains. A deeper analysis of case studies, such as Benidorm, which is the first world destination that has be certified under the UNE 178501 standard as smart tourism destination (Aguirre et al., 2023), would additionally support the identification of best practices and establishments of benchmarks for the higher maturity levels.

Within the qualitative model validation process, this study conducted multiple interviews with tourism experts and stakeholders located in the region of Algarve. Despite the fact that the Design Science Research paradigm approves of the use of a qualitative evaluation of the designed artifact, the results of the validation phase could be regarded as relatively subjective. With time as a scarce resource for the development of the dissertation, the validation had to be limited to a relatively small number of five tourism experts and stakeholders with limited timeframes for each interview. Although the inclusion of academic experts as well as tourism stakeholders intended to blend different viewpoints on the subject of sustainable tourism assessments, the small sample and unitary cultural background implies a limitation on the generalization of the model validation, also for other geographies and destinations in the world. In addition, the conducted interviews have shown that a true assessment of the dimension *Coverage and Completeness* required an in-depth review of the provided pre-read of the interviewee and an extended timeframe for the focus interview of minimum 1.5 hours. As this only applied in one of the conducted interviews, the findings have to be regarded as preliminary and would need to be contrasted with additional interviews. As a result, a potential next step for the future development of the model would be to conduct further design iterations based on interviews with a larger sample of experts and tourism stakeholders, also from destinations of different types, in addition to quantitative analyses and testing in different types of destinations, as described before.

Complementary to the maturity assessment itself, the model gives some indications for potentially relevant metrics to be applied in the design of improvement measures. The dissertation further elaborates on a potential implementation process and considerations for use of the model to support the successful application in a destination. As the focus interviews have shown, the availability and complexity of data is a crucial factor for tourism destinations in this day, hence a further development of the model might attempt to develop more detailed guidelines for the aggregation of relevant metrics at different territorial levels (as applied for each indicator by UNWTO, 2004) and may even investigate options to provide links to existing standardized metrics on national or supra-national level, depending on the destination context. To further support the translation of the model's results into measures, a further development could attempt to supply clear recommendations for managerial actions based on the destination's current and desired maturity score, as demonstrated in the Smart City Maturity Assessment and Benchmarking tool by Warnecke et al. (2019).

As De Bruin et al. (2005) note, generalisability of a maturity model and hence its broad acceptance will be an open issue until the model has been deployed and tested in entities that are independent of the model's development and validation process. To truly establish the Maturity Assessment Model for Sustainable Tourism as a standardized and globally accepted tool for industry practitioners, deployment in different types of destinations and thus collection of use cases is needed. This practical application in destinations with different levels of performance may be used for the establishment of benchmarks and to empirically validate and refine the definition of maturity stages and inspire further research perspectives. Following the deployment of a maturity model, De Bruin et al. (2005) highlight that *"the continued relevance of a model will be ensured only by maintaining the model over time"* (p.9). As the topic of sustainability itself as well as the application of ICT for sustainable tourism are fluid and ever-evolving, continuous maintenance of the model is required to ensure that the dimensions, sub-domains and definitions of maturity progress over time. For this, it would be advisable for researchers from different backgrounds (such as the environmental, economic, socio-cultural, technological, institutional, business operations domain, etc.) to provide their insights in an interdisciplinary approach. Through this, a more holistic and coherent body of theory and techniques could be developed that also advances the research in sustainable tourism as such (Liu, 2003). For the maintenance and further development of the model,

a continuous engagement of tourism stakeholders and practitioners is also needed to keep an equilibrium between scientific reliability of the model and practical relevance in future research (Ivars-Baidal et al., 2021b). As Warnecke et al. (2019) point out, it is hereby recommended to examine how destinations apply the model, whether it truly facilitates the alignment with strategic planning objectives of the destination and to which degree the results of the assessment are used to manage development across the prioritized fields of action.

Finally, it needs to be noted that the maturity assessment model developed in this study is mainly focused on the supply side of tourism. As different authors point out, tourism sustainability, however, has a very relevant angle as viewed from the demand side. Hall (2019, 13) argues with regards to sustainable tourism that *"the belief that all problems can be solved by exerting greater effort and demanding greater efficiency within the status quo of continued tourism growth and consumption, necessitates challenge".* This is to say that tourism destinations must not make the mistake to only focus on developing their capabilities from a supply-side perspective but to build their planning on a thorough analysis and forecasting of changes and effects in tourism demand. As Liu (2003) notes, demand management is a critical capability for tourism destinations nowadays as the types and quality of products that tourists favour are constantly changing. In addition, as Stephenson and Dobson (2020) point out, the advances of smart tourism, targeted marketing and social media campaigns might on the one hand help to increase destination competitiveness, but they might also turn into a driver for overtourism, as can be seen in European cities like Amsterdam, Barcelona, Berlin, Prague, Rome, and Venice).

Future developments of maturity models for sustainable tourism therefore might need to explore the dynamic component of the demand side, in order to allow the exploration of different scenarios based on changes in the whole tourism system and related impacts for destination's priorities and required management actions. Methodological links to adaptive environmental assessment models may be one option to introduce this view on the dynamic interactions and feedback loops between tourism supply and demand and to enable tourism destinations to leverage the power of data to shape the decisions about their future directions (Schianetz et al., 2007).

6.2 Policy Recommendations and Implications for Tourism Agencies

There is a lot of potential for further growth of the tourism sector (Liu, 2003) and post-pandemic statistics show that numbers are quickly bouncing back to the trend from previous years. (World Economic Forum, 2023). With this continuingly growing demand for tourism products, the main task of tourism practitioners cannot be to limit growth, but to manage it in a way that is appropriate for the host population, destinations' environment and tourists alike (Liu, 2003). As Liu (2003) notes further, this implies the development of theoretically founded policies and measures that are feasible to be applied in practice, so that sustainability ideals can truly be translated into actions, not only in niche tourism products, but all across mainstream, conventional mass tourism as well.

The maturity assessment model, inclusion its aspects around the application of technology, as proposed in this dissertation, can help destinations, especially those with limited resources, to prioritize fields for future development and, based on this, to initiate strategic interventions, optimize the allocation of public funds and further develop tourism planning and management (Punzo et al., 2022).

The results of the maturity assessment can hereby support an effective governance towards sustainable tourism, e.g. through the following means (Punzo et al., 2022; UNWTO, 2004):

- Definition of rules and guidelines for tourism stakeholders;
- Conduction of policy evaluations and active policy dialogue that creates links between tourism and local, regional and national plans and priorities;
- Establishment of adequate regulatory and legal frameworks for the tourism services and accommodation sector; creation of destination and site management plans, encompassing guiding and interpreting programs, visitor and information services, traffic control, environmental management and quality standards;
- Definition of contingency plans to address peak periods, emergencies and crises;
- Development of standards and practices to monitor safety and security;
- Implementation of policies specifically aimed at promoting tourism initiatives that contribute to social objectives, such as benefiting the poor, women, marginalized communities and regions.

The specific focus on destination management in the maturity model can help tourism agencies to establish a vision and roadmap for the development of capabilities to support other tourism stakeholders with trainings, capacity building, professional and technical assistance or financial incentives to make changes towards a more sustainable future. In addition, tourism agencies can use the assessment results to drive further knowledge sharing and innovation processes by connecting the different stakeholders in the tourism sector or building partnerships or joint venture arrangements (UNWTO, 2004). With these actions, tourism agencies can move from away from sustainability as a mere marketing claim and establish credibility towards current and potential tourists through transparent communication and public accountability (Ivars-Baidal et al., 2021a), e.g. by means of information brochures, tourism awareness programs and publication of information via destination websites (Twining-Ward and Butler, 2002).

In the present day, local governments and tourism authorities are still often characterized by rigid, institutionalized practices and developmental paths that have been shaped by historical contexts (Warnecke et al., 2019). For the maturity assessment to truly achieve its benefits in a destination, the right mindset is required from tourism stakeholders and key decision-makers. As the feedback from tourism stakeholders and experts has shown, commitment of various levels of tourism authorities and related institutions is key to really progress tourism towards sustainable development.

The use of the maturity assessment model and related potential for internal and external benchmarking can help as a vehicle to break up old views and institutional patterns. Leveraging the participatory approach suggested for its implementation, the review and evaluation of the destination should ideally become an intuitive part of continuous improvement and strategic development of the destination, instead of a one-time performance assessment (Warnecke et al., 2019). The dynamic view introduced by the maturity model can thereby help tourism agencies to understand sustainability as a journey and transition with different stages rather than a static goal that management must attain. (Diéguez-Castrillon et al., 2021). As Warnecke et al. (2019) point out, benchmarking and challenging the own maturity status can thus lead to a learning process that supports the development or evaluation of destination strategy and planning while discovering innovative ideas within the destination and from competitors. In addition to the above, a thorough change management approach including close stakeholder

engagement and application of the right participatory processes is needed to build the ground for effective and fruitful discussions.

In the public sector, the setting of priorities to address social issues has traditionally been a highly complex political process that involves multiple stakeholders and, in absence of objective data, often tends to favour the needs and opinions of the most connected and influential parties (Huang et al., 2022). As the authors note further, in the tourism sector, this often leads to a dominant position of powerful and large business that cater to a broad international tourism audience. As we enter the so called “insight era” with a data-rich environment, the ability of different stakeholder groups to express their opinions and needs with regards to tourism is changing (Huang et al,, 2022).

Global advances in connectivity and availability of data will bring new potentials for all actors in the tourism sector to integrate and standardize data from different sources, also on supra-national level (e.g. through the International Network of Sustainable Tourism Observatories). Different authors recommend the creation of an integrated destination data platform, that links sustainability metrics and indicators with local environmental management information systems and the destination management systems and to, this way, develop possibilities to apply Big Data techniques (e.g. including data from sensors, booking systems, etc.) or to open the information in the form of Open Data to foster transparency and innovation and directly link the different stakeholders in the tourism ecosphere (Huang et al., 2022; Perles Ribes and Ivars-Baidal, 2019).

As high levels of connectivity and digital infrastructure are needed to achieve such an integration governments, private sector and business actors in tourism need to cooperate investments to promote a structural transformation towards digitalization of the sector that encompasses all stakeholder groups (Surya et al., 2022). DMOs and tourism agencies now can leverage technology to become data-driven organizations. Attaining greater soundness and methodological harmonization in data analysis enables them to improve their decision-making capabilities regarding the management of tourism externalities and to achieve a critical competitive advantage (Ivars-Baidal et al., 2021). In addition, the development of analytical capabilities such as data mining can help them to develop actionable insights and facilitate the management and coordination of a transformation towards sustainability in the destination (Huang et al., 2022). For this,

DMOs and tourism authorities are required to overcome their inherent fear of technology and become aware of the potentials of technology for their operations (Ali and Frew, 2013). They need to prepare their workforce with the relevant technical and non-technical skills or the application of digital tools and potentially adapt their organizational structures in a way that is more decentralized and allows for horizontal flows of data and insights (Huang et al., 2022). This way, DMOs and tourism agencies can become true drivers for change and foster not only a progression towards higher levels of maturity, but a continuous improvement and sustained competitiveness of their destination.

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Appendices

Appendix A: Semi-structured interviews – Model presentation

AGENDA

01 Introduction and Background

02 Maturity Model for Sustainable Tourism

- Maturity Dimensions & SubDomains
- Maturity Levels
- Model Inputs and Outputs

03 Discussion and Feedback

04 BACKUP: Detailed Maturity Level Descriptions per Dimension

My profile

HANNAH FRANZ

Master candidate in Tourism Economics and Regional Development, University of Algarve

Nationality: German

Previous academic background in Business Administration/ International Management plus 10 years of working experience in industry and consulting across various industries. Within consulting, main focus has been on large scale business transformation projects with national and international scope.

Core competencies

- Project Management
- Management Consulting methods and tools
- Tourism Economics and Regional Development know-how
- Business Development

Academic Background

2007-2011	M.Sc. International Management *University of Cologne/ ESADE Business School Barcelona*
2006-2011	Diploma in Business Administration *University of Cologne*
2004-2006	Intermediate Diploma in Economics *University of Freiburg*

Professional Experience (Excerpt)

2018 – 2021 Senior Manager, Capgemini Invent

- Working as expert or project lead in various national and international consulting projects for leading companies in different industries
- Managed large-scale business transformation projects in the area of Innovation & Strategy, incl. stakeholder management up to C-Level; day-to-day project and team management; risk mitigation; preparation of client reports, steering committee and board meetings, workshop and events
- Developed a comprehensive maturity assessment model for Agile & Innovative Organizations, incl. design of semi-structured guides for focus interviews and focus groups, comprehensive evaluation tool and visualization of results

2017 – 2018 Management Consultant, Korn Ferry, Business Transformation

- Developed a client-centric service offering for business transformation
- Comprehensively assessed and evaluated industry trends and business needs as basis for the development of consulting methodologies and tools

2014 – 2017 Senior Consultant, Deloitte Consulting, HR Transformation

- Delivered client projects in the field of HR Transformation: developing points of views, methodologies, workshop formats and sales materials
- Conducted detailed maturity analyses and benchmarking (incl. analysis of as-is state of HR organization, processes, IT and customer interfaces; compilation of best practices, trends, KPIs and comparative data from reference companies; detailed gap analysis to identify possible fields of action and definition of recommendations for strategic focus areas)
- Developed a maturity assessment model for Service Delivery Organizations, incl. design of structured questionnaires, comprehensive evaluation tool and visualization of results

2011 – 2014 HR Professional, Bayer Direct Services

- Coordinated with all internal interfaces related to the administration of global mobility assignments and acted as point of contact for global HR contacts of the Bayer Group
- Managed compensation processes for expatriates
- Conducted process reviews and audits

Sustainability has become one of tourism's most pressing concerns, yet the concept remains difficult to grasp

Research Problem

Background

- Despite its potential positive impacts for destinations, tourism can create major risks and negative environmental, socio-cultural and economic effects
- Sustainability has therefore become one of the most pressing topics for tourism destinations worldwide
- Destination managers need to understand the concept of sustainability and implement the right actions
- Measurement and monitoring of these actions is key to ensure that destinations follow the right developmental path

Challenges

- Concept of sustainability is still perceived as vague
- Current sustainability assessment models (e.g. indicators) often are very complex and lack clarity of definitions
- Theoretical basis for assessment models often not clear
- Aspects of digitalization are not sufficiently acknowledged in existing tourism indicator models
- Due to the complex nature of the tourism sector as such, implementation of assessment models proves to be difficult

Goal of the research is to extend existing sustainability assessment methods for more practical relevance

Research Goal and Value Add

Goal

Development of a new and more complete assessment model for sustainable tourism that combines existing sustainability indicator models with a maturity model concept and adds a technology perspective

The model aims at featuring:

- Comprehensive view on relevant sustainability dimensions based on latest research
- Clear descriptions of maturity stages and developmental paths
- Clear visualization of results as basis for decision-making and communication
- Indications for a successful implementation of the model in a destination

Value Add

For Research:

- Evolutionary step to traditional assessments of tourism sustainability or assessments specifically focused on Smart Tourism Destinations
- Basis for further development of the tool in a cross-discipline view

For Practitioners:

- Answering to current demands of destination managers
  - in destinations of various developmental stages from well-established to new ones
  - in all stages of a destination planning cycle

The maturity assessment serves as an operational tool to support destinations on their sustainable development path

Maturity Model for Sustainable Tourism

SUMMARY

The maturity assessment is an excel-based tool that helps to assess a destination across four key dimensions and sub-domains. For each sub-domain the current status as well as the ambition level are defined. The results report highlights gaps that need an increased focus and identifies ways that the destination can begin to address these gaps and further mature.

APPLICATION

The maturity assessment compares the perceptions of the current state with the characteristics of the destination's ambition level in order to:

- Gain a common understanding of the current and target state
- Unveil different perceptions amongst stakeholders
- Identify the largest gaps between status quo and ambition
- Identify existing strengths and well-developed areas

RESULTS

The maturity assessment and report enables:

- Prioritization of focus areas for future planning
- Deduction of a developmental path and relevant metrics
- Baseline for stakeholder communication

6

The four dimensions of the model provide a holistic overview of as-is situation and to-be vision for sustainable tourism

Maturity Dimensions & Sub-Domains

Environmental

- Light and noise pollution
- Low impact transportation
- Sewage
- Solid waste
- Landscape and biodiversity protection
- Climate change
- Emissions
- Energy
- Water

Economic

- Distribution of benefits to all
- Leakages and linkages
- Employment
- Seasonality
- Competitiveness of destination

Socio-cultural

- Wellbeing of host communities
- Health and Safety
- Property and user rights
- Traditional access
- Inclusion
- Protecting cultural heritage

Destination Management

- Strategy
- Development control
- Data, information and monitoring
- Connectivity
- Sustainability reporting and communication
- Visitor satisfaction and interaction
- Organization and governance
- Capacity building, knowledge sharing and innovation
- Destination image, branding and marketing
- Risk and crisis management

The model uses four distinct and clearly defined levels to delineate different stages in maturity for each sub-domain

Maturity Levels - Overall

BASIC	PROGRESSING	ADVANCED	LEADING
Basic understanding of tourism impacts and sustainability requirements in the destination. No formalized approach to sustainable tourism development. ICT integration is limited.	Principles of sustainable development are acknowledged. Basic initiatives towards sustainable tourism development have been implemented. Initial concepts for the integration of technology have been developed. Initial sustainability-related objectives have been documented and performance is measured.	Sustainability impacts of tourism are being regularly measured and evaluated. Strategic planning and implementation of concepts to foster sustainable tourism development. Advanced integration of ICT to measure, analyse and publish relevant data and information to tourism stakeholders. Active stakeholder engagement in the development of plans, regulations and activities. Stakeholder feedback is used for continuous improvement of the tourism experience and DMO operations.	Sustainability as major guiding principle for tourism development in the destination. Continuous planning for sustainable tourism development takes place based on real-time data, advanced analytics, and the integration of all stakeholders through active knowledge exchange. DMO focuses on driving the further development of the destination' sustainability strategy through continuous performance management and active support and information for all tourism stakeholders.

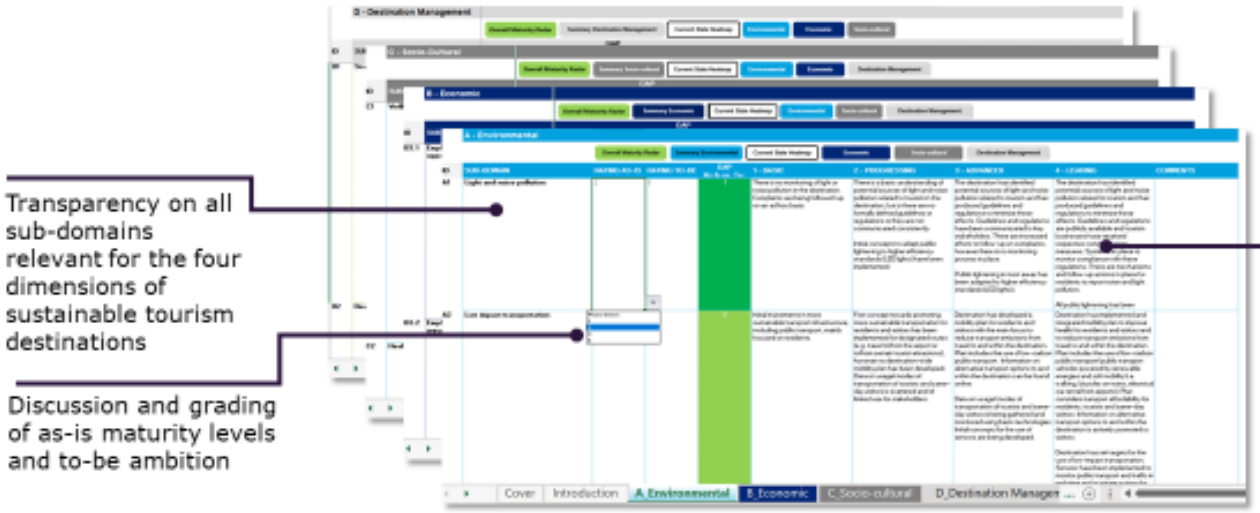
Source: Own elaboration, inspired by Warnecke et al. (2018)

8

As-is and desired to-be maturity levels are evaluated across all sub-domains, using detailed level descriptions as reference

Model Inputs

Assessment across four dimensions



Results of the assessment display the current state, the gaps to the desired to-be state as well as relevant metrics

Model Outputs

Current State Heatmap

Comprehensive overview of as-is maturity level across all four dimensions, to identify most burning platforms at present

Maturity Radar Charts

Clear overview of as-is, desired to-be maturity and gaps across all four dimensions

Detailed Maturity Charts for each dimension, detailing maturity gaps for each sub-domain and referencing an inventory of metrics to support developing the maturity in sub-domains with the largest gap

Appendix B: Semi-structured interviews – Interview guide

Preparation

- Provision of pre-read to participants, incl. maturity dimensions, sub-domains and respective maturity level descriptions

VALIDATION SESSION

Format: Focus Interview

Section 1 – Introduction and background

- Brief self-description of participants:
  - What is the name of your organization/ institution?
  - What is your field of expertise/ position in the organization?
  - What is your experience with the subject of sustainable tourism/ sustainability assessments?
- Brief introduction of the author/ interviewer and thesis background

Section 2 – Presentation of the model

- Check whether there are any general questions or concerns regarding the maturity model for sustainable tourism based on the pre-read
- Using ppt presentation: Presentation of maturity model incl.
  - Maturity Dimensions & Sub-Domains
  - Model Inputs and Outputs
  - Overall Maturity Levels

Section 3 – Model evaluation

Guiding questions for discussion:

A. Simplicity:
   - Is the model designed in such a way that is it clearly and easily understood?

B. Coverage and Completeness:
   - Does the model adequately address all relevant dimensions of sustainable tourism?
   - Does the model adequately address all relevant sub-domain per dimension?
   - Is the allocation of sub-domains to dimensions adequate?
   - Does the model adequately delineate the maturity levels?
   - Are the maturity level descriptions clear and complete?
   - Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, …)?
   - Does the model adequately address all the different stakeholders in a tourism destination?
   - Does the model apply to all types of tourism destinations?

C. Usefulness:
- How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?
- Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?
- What are the main strengths of this model?
- Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?

D. Implementation:
- What could be the main difficulties of implementation of this assessment tool?
- What do you think are success factors for a successful implementation of the assessment tool?
- What could be risks?
- How to overcome the identified implementation difficulties and risks?

Section 4 – Session Evaluation and Closing

Guiding questions:

- Have I missed anything – is there anything else you think I should ask?
- Do you have any suggestions for the improvement of the validation technique?
- Would you like to make any other comments?

Appendix C: Maturity assessment tool – Cover

Sustainable Tourism Maturity Assessment

The Sustainable Tourism Maturity Assessment offers a structured tool to assess destinations on four key dimensions and detailed sub-domains.

Prepared for:

Appendix D: Maturity assessment tool – Introduction

Sustainable Tourism Maturity Assessment

Purpose

The purpose of this document is to assess each of the four sustainable tourism dimensions, i.e. Environmental, Economic, Socio-Cultural and Destination Management, in order to understand the current maturity of the destination ("As-Is") and to establish a vision of the target state ("To-Be").

Maturity Level

1 - BASIC	Basic understanding of tourism impacts and sustainability requirements in the destination. No formalized approach to sustainable tourism development. ICT integration is limited.
2 - PROGRESSING	Principles of sustainable development are acknowledged. Basic initiatives towards sustainable tourism development have been implemented. Initial concepts for the integration of technology have been developed. Initial sustainability-related objectives have been documented and performance is measured.
3 - ADVANCED	Sustainability impacts of tourism are being regularly measured and evaluated. Strategic planning and implementation of concepts to foster sustainable tourism development. Advanced integration of ICT to measure, analyse and publish relevant data and information to tourism stakeholders. Active stakeholder engagement in the development of plans, regulations and activities. Stakeholder feedback is used for continuous improvement of the tourism experience and DMO operations.
4 - LEADING	Sustainability as major guiding principle for tourism development in the destination. Continuous planning for sustainable tourism development takes place based on real-time data, advanced analytics, and the integration of all stakeholders through active knowledge exchange. DMO focuses on driving the further development of the destination's sustainability strategy through continuous performance management and active support and information for all tourism stakeholders.

Colouring

The gap between as-is and to-be state is **"0"**
The gap between as-is and to-be state is **"1"**
The gap between as-is and to-be state is **"2"**
The gap between as-is and to-be state is **"3"**

Appendix E: Maturity assessment tool – Input matrices

A - Environmental

Overall Maturity Radar | Summary Environmental | Current State Heatmap | Economic | Socio-cultural | Destination Management

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
A1	Light and noise pollution	2	3	1	There is no monitoring of light or noise pollution in the destination. Complaints are being followed-up on an ad hoc basis.	There is a basic understanding of potential sources of light and noise pollution related to tourism in the destination, but is there are no formally defined guidelines or regulations or they are not communicated consistently. Initial concepts to adapt public lightening to higher efficiency standards (LED lights) have been implemented.	The destination has identified potential sources of light and noise pollution related to tourism and has produced guidelines and regulations to minimize these effects. Guidelines and regulations have been communicated to key stakeholders. There are increased efforts to follow-up on complaints, however there is no monitoring process in place. Public lightening in most areas has been adapted to higher efficiency standards (LED lights).	The destination has identified potential sources of light and noise pollution related to tourism and has produced guidelines and regulations to minimize these effects. Guidelines and regulations are publicly available and tourism businesses have received respective communication measures. System is in place to monitor compliance with these regulations. There are mechanisms and follow-up actions in place for residents to report noise and light pollution. All public lightening has been adapted to higher efficiency standards (LED lights).	
A2	Low impact transportation	3	3	0	Initial investments in more sustainable transport infrastructure, including public transport, mainly focused on residents.	First concept towards promoting more sustainable transportation for residents and visitors has been implemented for designated routes (e.g. travel to/from the airport or to/from certain tourist attractions), however no destination-wide mobility plan has been developed. Data on usage/ modes of transportation of tourists and same-day visitors is scattered and of limited use for stakeholders.	Destination has developed a mobility plan for residents and visitors with the main focus to reduce transport emissions from travel to and within the destination. Plan includes the use of low-carbon public transport. Information on alternative transport options to and within the destination can be found online. Data on usage/ modes of transportation of tourists and same-day visitors is being gathered and monitored using basic technologies. Initial concepts for the use of sensors are being developed.	Destination has implemented and integrated mobility plan to improve health for residents and visitors and to reduce transport emissions from travel to and within the destination. Plan includes the use of low-carbon public transport/ public transport vehicles powered by renewable energies and soft mobility (i.e. walking, bicycles on trains, electrical car rental from airports). Plan considers transport affordability for residents, tourists and same-day visitors. Information on alternative transport options to and within the destination is actively promoted to visitors. Destination has set targets for the use of low-impact transportation. Sensors have been implemented to monitor public transport and traffic in real-time and to initiate actions for efficiency improvements.	
A3	Sewage	2	4	2	No/ only basic guidelines in place regarding wastewater treatment. <39% of the destination's wastewater receives centralised treatment to at least secondary level. Large number of tourism establishments without connection to (suitable/effective) treatment systems.	Initial guidelines regarding wastewater treatment have been set up. Monitoring/ testing of discharge from septic tanks and wastewater treatment systems occurs on an ad hoc basis. 40-59% of the destination's wastewater receives centralised treatment to at least secondary level. Substantial number of tourism establishments without connection to (suitable/effective) treatment systems.	Advanced guidelines regarding wastewater treatment have been implemented. Treatment, reuse and release of wastes is infrequently monitored/ tested. 60-79% of the destination's wastewater receives centralised treatment to at least secondary level. Small number of tourism establishments without connection to (suitable/effective) treatment systems.	The destination has clear and enforced guidelines in place for the siting, maintenance and testing of discharge from septic tanks and wastewater treatment systems. Proper treatment, reuse and release of wastes is regularly monitored/ tested to prevent adverse impacts on the local population and the environment. >80% of the destination's wastewater receives centralised treatment to at least secondary level. All tourism establishments are connected to (suitable/effective) treatment systems.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
A4	Solid waste	3	4	1	There is no centralized system for the disposal and collection of solid waste. Solid waste is frequently incinerated or deposited in an uncontrolled manner. <30% of the destination's solid waste is recycled upon individual efforts (e.g. composited).	Basic program is in place to manage solid waste. Initial concept for recycling and waste reduction is being developed. A sustainable system for disposal/ collection of residual waste is provided centrally. 31-50% of the destination's solid waste is recycled. Some tourism establishments are recycling their own waste (e.g. composting).	Basic circular economy strategy exists focusing on recycling and waste management in the destination. Results and targets are being published. A recycling system with at least four streams (i.e. organic, paper, metal, glass and plastic) exists with a broad coverage. 51-70% of the destination's solid waste is recycled. A coordinated campaign on waste management, including food waste and reduction/elimination of single use items, especially plastics is in place with tourism enterprises. Large number of tourism establishments are committed to separate waste.	Advanced circular economy strategy (explicitly including tourism) exists, focusing on designing out waste and pollution, increasing material and product reuse, and regenerating natural systems. Performance reports are produced on a regular basis. Destination covered by multiple-stream collection and recycling system which effectively separates waste by type to divert solid waste from landfill. Waste collection system has implemented sensors (in vehicles, containers, etc.) for higher efficiency in collection process. >71% of the destination's solid waste is recycled. The destination encourages enterprises to avoid, reduce, reuse, and recycle solid waste, including food waste. Action is taken to eliminate or reduce single-use items, especially plastics. Any residual solid waste that is not reused or recycled is disposed of safely and sustainably. Public campaign to eliminate dropping of litter, including by visitors, and to keep public spaces clean is in place. Employees of tourism businesses are informed and trained in the use and disposal of the substances they use (e.g., cleaners knowledgeable of how to deal with waste cleaning fluids, engineers trained in emergency spill handling)	
A5.1	Landscape and biodiversity protection - Strategy	1	3	2	No biodiversity strategy exists in the destination.	A basic biodiversity strategy has been set up for the destination, but is not regularly monitored or revised. Basic understanding of the impacts of tourism on the natural environment exists, but has not yet been explicitly included in the strategy.	A general, time-bound biodiversity strategy is in place with a regular monitoring and revision process. Some references on the impacts of tourism on the natural environment are made. Initial concepts for the identification of protected areas have been implemented, but only with a limited extend (in square km) and without classification levels.	Destination has a time-bound biodiversity strategy, that explicitly includes a system to monitor, measure and respond to the identified threats and impacts from tourism on the natural environment and prevent the introduction and spread of invasive species. Protected area(s) are identified and classified to an extend and by level of protection as per IUCN guidelines to conserve vulnerable ecosystems, habitats and species.	
A5.2	Landscape and biodiversity protection - Management of natural sites	3	4	1	No structured system for the management of visitors at natural sites in place. Visitor flows are not being monitored or managed. Tour operators and tour guides have different approaches to visitor management.	Basic guidelines for management of visitor at natural sites exist for tour operators and guides, but compliance with guidelines is not monitored. Visitor flows are monitored on an ad hoc basis. Visitors do not received any specific guidance for their visit at the natural site.	System is in place for the management of visitors within and around natural sites. Visitor flows are monitored manually. Guidelines for tour operators and guides are in place and being enforces. There is substantial commitment from local enterprises to support protection and management of natural sites. Some tour operators/ tour guides provide guidelines on visitor behaviour. Income from tourism is used for protection, restoration and conservation of natural assets on a case by case basis.	The destination has a system for the management of visitors within and around natural sites, which takes account of their characteristics, capacity and sensitivity and seeks to minimize adverse impacts. Sensors are used to continuously monitor visitor flows and to initiate mitigating actions, if needed. Tourist sites are geolocated in a dynamic online map for visitors to consult. Guidelines for visitor behaviour at sensitive sites are made available to visitors before and at the time of the visit. A code of practice/ trainings are provided for tour operators and tour guides on visitor management at natural sites. A large percentage of local enterprises in the tourism sector are actively supporting protection, conservation and management of natural sites. There are mechanisms in place to use income from tourism for protection, restoration and conservation of natural assets.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
A6	Climate change	2	4	2	No strategy has been formulated regarding climate change mitigation/ adaption.	Initial guidelines for the mitigation of climate change effects have been developed, but no coherent strategy exists. Contingency or emergency plans have been developed for few selected tourist zones, but only few infrastructure investments have been made.	Destination has a climate change mitigation strategy. Some tourism enterprises take part in climate change mitigation schemes, based on individual initiative. A large number of key tourist zones are covered by contingency or emergency planning. Some infrastructure has been set up to protect most vulnerable sites.	Destination has a climate change adaptation strategy, with specific reference to tourism. A high percentage of tourism enterprises have been encouraged to take part in climate change mitigation schemes (e.g. CO2 offset, low energy systems, etc.) as well as adaptation responses and actions. All key tourist zones are covered by contingency or emergency planning. Infrastructure (e.g. sea defences) has been set up for all vulnerable zones, as applicable.	
A7	Emissions	2	4	2	No strategy has been formulated regarding the reduction of emissions.	Initial guidelines for the reduction of emissions have been developed, but no coherent strategy exists. Monitoring of air quality and initiation of mitigating actions is done on an ad hoc basis.	The destination has defined targets to increase air quality and reduce greenhouse gas emissions, but targets are not time-bound or qualitative. A basic monitoring and reporting is prepared for key stakeholders. Some tourism enterprises measure, monitor, reduce or minimise, and mitigate greenhouse gas emissions from their core operations based on individual initiative.	The destination has defined a roadmap to carbon neutrality, specifically including tourism. . Ambitious, time-bound targets are set to increase air quality and reduce greenhouse gas emissions. An annual climate report, including monitoring and mitigation actions is prepared and published. All tourism enterprises are encouraged to measure, monitor, reduce or minimise, publicly report and mitigate greenhouse gas emissions from all aspects of their operations (including from suppliers and service providers).	
A8	Energy	2	3	1	No targets to reduce energy or increase energy efficiency have been set up.	Initial guidelines to reduce energy have been developed, but no targets have been defined. Monitoring of energy efficiency is done on an ad hoc basis. Some tourism enterprises are taking measures to reduce energy or increase energy efficiency based on individual initiative.	Some basic targets (e.g. on energy consumption, efficiency or use of renewable energy) are publicised and promoted. Initial campaigns have been developed to promote monitoring and reducing energy, increasing energy efficiency and use of renewable energy by tourism enterprises. A basic monitoring and reporting is prepared for key stakeholders.	A smart grid (intelligent energy system) has been implemented in the destination. The destination has targets to reduce energy consumption, improve efficiency in its use, as well as increase the use of renewable energy. A regular central reporting, including monitoring and mitigation actions is prepared and published. The destination has a comprehensive system (incl. support and incentives) to encourage enterprises to measure monitor and reduce energy consumption, increase efficiency (e.g. through improved insulation), use renewable energy sources, and publicly report their contribution to the destination targets.	

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ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
A9	**Water**	3	3	0	No formal assessment of water risk. Water quality is monitored on an ad hoc basis.	Initial concepts to assess and document water risk have been implemented, but no water stewardship goals are defined. Basic guidelines on monitoring and reduction of water usage has been published for tourism enterprises. Initial concepts to monitor water quality in the destination have been implemented, but no formal quality standards or documentation have been defined. Water quality issues are replied to on an ad hoc basis.	Water risk in the destination is regularly assessed and documentation is provided to key stakeholders. Initial concepts for the use of sensors have been implemented. In cases of high water risk, basic water stewardship goals are defined and adherence to goals by tourism enterprises is infrequently monitored. Active guidance and support for monitoring and reduction of water usage is given to enterprises based on individual initiative. Water quality in the destination is regularly monitored based on quality standards and documentation is provided to key stakeholders. A system is in place to respond in a timely manner to water quality issues.	Destination has a program in place to regularly assess and water risk based on sensors, incl. publicly available data and reports data and reports. A system is in place to respond in a timely manner to water risk. In cases of high water risk, water stewardship goals are identified and actively pursued with enterprises, to ensure that tourism use does not conflict with the needs of local communities and ecosystems. High number of tourism establishments are participating in water conservation programmes (e.g. hotel using water saving shower heads, flush systems, advising guests on water saving, reusing of towels) or recycling treated wastewater (e.g. for irrigation purposes) and measure, monitor and publicly report water usage. Destination has a program in place to regularly monitor water quality for drinking, recreational and ecological purposes using quality standards Data and reports on water quality are publicly available. A system is in place to respond in a timely manner to water quality issues. Where applicable, visitor are provided with information on quality of local drinking water, to encourage use as alternative to bottled water.	

Note: Contains exemplary ratings for illustration purposes

B - Economic

Overall Maturity Radar | Summary Economic | Current State Heatmap | Environmental | Socio-cultural | Destination Management

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
B1	**Distribution of benefits to all**	2	3	1	No/ little consideration of local effects during the planning phase of significant new developments. No formalized development programs in place.	Initial concepts for the assessment of local effect during the planning of significant new developments have been implemented. Basic programs to support local economical development have been set up. Few sponsorships for poor local communities exist based on individual initiative from enterprises or visitors.	Effects for local communities are being assessed and addressed as part of the planning process for some significant new developments (e.g. infrastructure developments to benefit local communities) Evidence of more advanced, centrally coordinated development programs to support the provision of economic benefits to all (e.g. leveraging local tourism revenues, taxes and levies) Evidence of collaboration of local stakeholders to set up beneficiary schemes for poor local communities or provide sponsorships.	Benefits and disadvantages for local communities are being assessed as part of the planning process for all significant new developments (e.g. provision of new roads, boat links, telecommunications, clean water supply and sanitation but also depletion of natural resources for local people, displacement, etc.). Broad development programs are in place to support the provision of economic benefits, especially to poor areas of the local community (e.g. allocation of a proportion of revenues from entrance fees or concession, local licence fees, levy on bed nights, hypothecating tourist related taxation for local development projects) Beneficiary schemes are in place that include sponsorship from local enterprises and visitors, either monetary or in kind, e.g. for legal or medical advice. Usefulness of development programs and contribution to household needs is regularly assessed through community surveys or audits.	
B2	**Leakages and Linkages**	2	4	2	Low ratio of locally owned businesses involved in tourism in the destination. High ratio of imported labour and goods for tourism establishments. Local farmers, businesses, artisans etc. are largely excluded from tourism supply chain.	There is a growing awareness for local produce and crafts in the destination. Direct retailing and promotion of selected local products and services is encouraged within few hotels and tourism enterprises. Initial concepts (e.g. access to simple support and advice) have been implemented to support the informal sector to organise and manage itself and provide opportunities for the establishment of local tourism-related SMEs.	Dedicated programs/ projects are in place to strengthen links between formal sector and informal sector/ local suppliers, help local farmers, artisans and food producers engage in the tourism value chain and encourage and assist local tourism enterprises to purchase goods and services locally. Co-operative arrangements among small suppliers are actively being encouraged and supported. Some initiatives are set up to foster training and capacity building in the informal sector, in order to improve the quality, variety and appeal of the products and services on offer.	The direct and indirect economic contribution of tourism to the destination's economy is monitored and publicly reported. The destination actively encourages the retention of tourism spending in the local economy through supporting local enterprises, supply chains and sustainable investment. It promotes the development and purchase of local sustainable products (e.g. food and beverages, crafts, performance arts, agricultural products) based on fair trade principles and that reflect the area's nature and culture. Tourism enterprises receive assistance with auditing their existing sources of supply, and identifying suitable local alternatives. Comprehensive programs are in place to build capacities for the establishment and improvement of local tourism-related SMEs (advice, financial support and incentives, assistance with market access). Industry ambitions or standards for sustainable supply chain management are set and promoted within the destination.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
B3.1	**Employment - Decent work and career opportunities**	1	3	2	Career development programs or trainings have not been clearly defined for tourism jobs in the destination. Few companies offer flexible working schedules or equal opportunity of local employment.	Career development programs or trainings have been defined for the tourism management level jobs in the destination. Some tourism enterprises offer flexible working hours and part time contracts. Initial concepts have been developed to promote equality of opportunity for local employment.	Career development programs or trainings have been defined for most tourism jobs in the destination. Most tourism enterprises offer flexible working hours and part time contracts. Most tourism enterprises support equality of opportunity for local employment. Initial concepts have been developed that are targeted to support local youth and at-risk youth.	Formal training and career paths are in place to help employees in tourism businesses obtain the experiences needed for career progression. Family friendly rostering, flexible working hours and part time contracts are broadly offered to enable the widest range of people with different personal circumstances to apply in the sector, while still offering job security within such arrangements. Tourism enterprises broadly commit to providing equality of opportunity or a preference in recruitment for local employment, training and advancement and a safe and secure working environment. Dedicated programs are in place to provide scholarships. training opportunities and work programs for local youth and at-risk youth.	
B3.2	**Employment - Employee benefits and rewards**	2	4	2	Rewards philosophy across the tourism sector in the destination is narrowly focused on compensation. Very basic benefits are being provided. No or only narrowly defined wellbeing strategies in place for employees.	Rewards philosophy across the tourism sector is broader than just focused on compensation. Employer sponsored health insurance and health services are being provided by few tourism enterprises. Few enterprises have set up a basic wellbeing strategy and related benefits for their employees.	Holistic rewards philosophy that is closely linked to an advanced wellbeing strategy for employees in the tourism sector. Employer sponsored, comprehensive health insurance is provided by some tourism enterprises. Some employers have set up collaborations with clinics to provide free/subsidised health checkups for staff and family members. Most tourism enterprises in the destination provide a set of benefits for employees, e.g. to support child care. Most tourism enterprises have set up initial occupational health and safety programs.	Tourism enterprises in the destination provide a wide range of benefits for employees, e.g. day care for employees with children, staff transport after night shifts. Employer sponsored, comprehensive health insurance is provided widely to employees in the tourism sector. Employees receive free/subsidised health checkups and clinics are made available for staff and family members. Tourism enterprises broadly promote staff awareness of occupational health and safety issues. Healthy in house food services and deliver nutrition education is widely made available for employees. Employers enforce smoke free workplaces and offer "quit" incentive programs.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
B4	**Seasonality**	3	4	1	Effects from seasonality (e.g. on employment, resource capacities, etc.) are unmanaged. The destination does not collect any data and information on visitor flows.	Data and information on visitor flows exists from different sources in the destination, but the data is or the data is inconsistent and of limited use. Destination reacts to effects from seasonality (e.g. resource capacity shortages in peak times) on an ad hoc basis.	Data and information on visitor flows is rich, exhaustive and consistent and managed in a central system within the destination, enabling a planning of capacities and funds to manage infrastructure and resources. Some tourism products have been developed, focusing on shoulder and low season, but no comprehensive strategy exists.	The destination has a comprehensive strategy in place to offer and promote alternative activities (e.g. festivals, conferences, etc) during shoulder and low season. Tourism flows throughout the year are being monitored, supported by sensor data, as a baseline to manage infrastructure and resource capacities (e.g. electricity, sewage and garbage system capacity or water supply system management for tourism and locals) and allocate relevant fundings for operation and maintenance.	
B5	**Competitiveness of destination**	3	4	1	The destination does not collect any data and information on visitors or competitors. Information on the destinations competitive performance is almost non-existent, and data is inconsistent and of limited use.	A basic understanding of market demand, positioning and competitors exists, but a competitive strategy has not been developed. Initial concepts have been implemented to develop niche products and clusters.	Data and information on market demand, positioning and competitors is rich, exhaustive and consistent and used for a focused development of niche products and clusters, but no comprehensive competitive strategy exists. Initial concepts have been developed to align tourism enterprise goals and objectives with the destination tourism strategy. Substantial number of tourism stakeholders engage in tourism industry associations.	The destination has a comprehensive competitive strategy based on a thorough understanding of its own and competitors strengths and weaknesses, market positioning, threat of new competitors, pricing, etc.). Strategy includes targets to drive tourism revenues from niche products and clusters. All tourism enterprises are encouraged to integrate their business strategy goals and objectives with the destination tourism strategy and participate in cooperative marketing. Broad participation of stakeholders in tourism industry associations.	

Note: Contains exemplary ratings for illustration purposes

C - Socio-Cultural

Overall Maturity Radar | Summary Socio-cultural | Current State Heatmap | Environmental | Economic | Destination Management

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
C1	**Wellbeing of host communities**	2	3	1	The destination does not collect any data and information on the wellbeing of the local community. General rules and regulations exist for behaviour in public places, but are not specifically targeted to protect local communities. Volunteering and social engagement occurs on an ad hoc, unmanaged basis.	A basic understanding of wellbeing factors for the local community exists, mitigating actions are being initiated ad hoc. Initial concepts have been implemented to protect local communities and residential areas around key tourism sites. Initial guidelines have been developed to foster responsible community engagement by enterprises and visitors.	Information about the economic and social wellbeing of local communities is being gathered and assessed infrequently (e.g. through resident surveys) and initial mitigation measures have been developed. Some regulations are in place to specifically protect the local communities and control tourism behaviour in proximity to residential and children's play areas. Initial concepts for the use of sensors to monitor tourism impact in key areas are being developed. There is evidence for some contribution of tourism to the development of social services for the benefit of the local community. Some schemes exist, and are promoted, for visitors to support local community and sustainability initiatives in a responsible, non-intrusive and non-exploitative manner.	The destination has a system in place to gather and assess information on the economic and social development of local communities within tourism development areas (incl. e.g. resident satisfaction with tourism, cost of living changes, ratios of tourists to locals, migration into/ out of the community) and to use it for the development of regulations and mitigation programs. There are regulations in place to protect the local communities e.g. of noise, congestion, alcohol consumption and loitering and to control tourist behaviour in proximity to residential and children's play areas. Sensors have been implemented for real-time monitoring and initiation of mitigation actions, as needed. Tourism in the destination contributes to a large degree to the provision of social services and health programs, e.g. regarding responsible use of alcohol, drug abuse or domestic violence. The destination engages enterprises, visitors, and the public to contribute to community and sustainability initiatives in a responsible, non-intrusive and non-exploitative manner.	
C2	**Health and Safety**	2	4	2	Basic security and health services in place in the destination. No/ only basic risk management or health and safety measures exist upon individual initiatives of tourism enterprises, without central monitoring.	Initial concepts have been developed to improve security and health services, but are mainly focused on visitors (e.g. private security and clinics). Initial guidelines regarding risk management and health and safety have been set up for tourism establishments. Monitoring of adherence to guidelines occurs on an ad hoc basis. Communication on health messages or safety procedures occurs reactive, on an ad hoc basis.	Some security and health services have been established that address the needs of both visitors and residents. A risk management plan, health and safety programs, incl. Official standards and regulations are in place at most tourism establishments and is infrequently monitored. Basic food hygiene guidelines have been developed and are being infrequently monitored at tourism establishments. Basic concepts to address health messages and safety procedures in tourism brochures have been developed.	Security and health services are well established and active in the destination and address the needs of both visitors and residents. A risk management plan, Occupational Health and Safety (OHS) programs, incl. hygiene and pest management standards and regulations are in place broadly across tourism enterprises. Adherence to standards (e.g. safety signage, equipment, staff trainings) is regularly monitored and followed up. Specific food hygiene standards and regulations are in place, promoted and monitored for tourism establishments. Evidence of collaboration with public health/ promotion units to reinforce health messages and good safety procedures (e.g. in tourist brochures).	
C3	**Property and user rights**	1	3	2	No laws or regulations in place regarding property or user rights. Tourism development and activities is carried out without public consultation, consent of compensation for affected communities.	Basic laws and regulations regarding property or user/ access rights are in place, but enforcement is weak. For major tourism developments, public information and consultation takes place and basic schemes are set up for compensation.	Advanced laws and regulations regarding property rights are in place and being enforced. Initial concepts have been implemented to ensure compliance with communal and indigenous rights. Public consultation, consent and fair and just compensation is applied for most tourism developments and actives. Laws and regulations protect user and access rights to selected key resources.	Destination has laws and regulations regarding property rights and acquisitions with regards to all tourism development and activities (incl. bank loans and donor grants) in place that are being enforced. They comply with communal and indigenous rights, ensure public consultation and do not authorize resettlement without free prior and informed consent and fair and just compensation. Laws and regulations also protect user and access rights to all key resources, as applicable.	
C4	**Traditional access**	1	4	3	No regulations in place to protect local community access to visitor sites, facilities and services. No data on traditional access is being gathered.	Basic guidelines for the accessibility of visitor sites, facilities and services for the local community have been developed, but accessibility/ traditional access is only being monitored on an ad hoc basis.	Most sites, facilities and services, including those of natural and cultural importance, in the destination are accessible to all, including the local community. Accessibility to natural and cultural sites for the local community is infrequently monitored, using basic metrics and resident surveys. Initial concepts to specifically protect or rehabilitate local community access (e.g. improving site access and use, reducing financial barriers to access) have been developed.	All sites, facilities and services, including those of natural and cultural importance, in the destination are accessible to all, including the local community. Regulations and standards are in place regarding the accessibility of visitor sites, facilities and services, specifically fostering broad actions to protect and/or rehabilitate local community access. Accessibility to natural and cultural sites for the local community is monitored (e.g. frequency of visits by locals, % of sites freely accessible to public, cost of access expressed in hours of local wages, perception of change in accessibility due to tourism growth, number of complaints by local residents regards access) to take corrective actions, if needed.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
C5	**Inclusion**	2	4	2	No general concepts in place to ensure accessibility of tourism sites, facilities or services for people with different access needs.	Initial concepts in place to ensure accessibility of tourism sites, facilities or services for people with different access needs. Solutions are designed and implemented on an ad hoc basis, without adherence to specific standards.	Most tourism sites, facilities and services, are accessible to people with a broad range of access needs. Standards and policies for the design and implementation of accessibility solutions have been developed and are being monitored infrequently. Most public transport is suitable for mobility of persons with disabilities. Walkways are in certain areas adapted for people with disabilities. Most commercial accommodation establishments have availability of hotel rooms accessible to persons with disabilities. Initial concepts have been implemented by tour companies to accommodate persons with disabilities. Details of accessibility included in visitor information about key sites, but there is no comprehensive information available to support visitors with accessibility challenges navigating the destination.	Where practical, tourism sites, facilities and services, are accessible to people with a broad range of access needs, based on consistently applied standards and policies. Where sites and facilities are not immediately accessible, solutions are implemented that account for both the integrity of the site and the needs of persons with access requirements (e.g. automatic door openers, wheelchair accessible restrooms, etc.). All public transport (incl. airports, piers, bus stations, etc.) is suitable for mobility of persons with disabilities. Walkways are fully adapted for people with disabilities. Broad availability of hotel rooms that are accessible to persons with disabilities (easy access, bathrooms that accommodate wheelchairs, safety bars etc.). Tour companies in the destination offer specific programs to accommodate persons with disabilities and provide specific training to their guides. For longer tours, staff with medical or paramedical training suitable to the range of needs of clients is available. Places of interest, transport lines, hotels / venues that support visitors with accessibility challenges are provided to visitors to navigate the destination. Details of accessibility are also included in visitor information about all key sites. All commercial accommodation establishments participate in recognised accessibility information schemes. Satisfaction of visitors with disabilities is regularly measured to identify concerns and develop mitigating actions/ plans.	
C6.1	**Protecting cultural heritage - intangible assets**	2	3	1	No identification or listing of destination's intangible cultural heritage. Visitors experience local culture and traditions ad hoc, without interpretation. There are no rules or regulations in place to specifically protect intellectual property rights in the development of tourism experiences.	Intangible cultural heritage has been identified and listed. Initial concepts are in place to develop visitor experiences focused on traditional/local culture and heritage, promote culturally distinctive products, etc. Interpretation of culture and traditions is handled individually by each tour operator/ guide/ attraction without existence of any guidelines. Basic guidelines are in place to protect intellectual property rights of communities and individuals in the development of cultural experiences for visitors, but they are not monitored or not broadly communicated.	The destination supports the celebration and protection of specific intangible cultural heritage (e.g. arts, distinctive products, music, gastronomy), but no overarching strategy has been developed. There is evidence of involvement of local and indigenous communities in developing and delivering some visitor experiences with sensitive and respectful interpretation based on intangible cultural heritage. Rules and regulations are in place to protect intellectual property rights of communities and individuals in the development of cultural experiences for visitors. They are broadly communicated and compliance is infrequently monitored.	The destination has a strategy in place to emphasize the celebration and protection of identified intangible cultural heritage, including local traditions, arts, distinctive products, music, language, gastronomy and other aspects of local identity and distinctiveness. The presentation, replication and interpretation of living culture and traditions is sensitive and respectful, seeks to involve and benefit local communities, and provides visitors with an authentic and genuine experience. The destination has a system to contribute to the protection, preservation and communication of intellectual property rights of communities and individuals in the development of cultural experiences for visitors.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
C6.2	**Protecting cultural heritage - tangible assets**	2	3	1	No identification or listing of destination's tangible cultural assets. There are no rules or regulations in place govern the handling of cultural artefacts. No structured system for the management of visitors at cultural sites in place. Visitor flows are not being monitored or managed. Tour operators and tour guides have different approaches to visitor management.	Tangible cultural assets have been identified and listed. Basic guidelines are in place to govern the handling of cultural artefacts, but compliance is not monitored or they are not broadly communicated. Basic guidelines for management of visitor at cultural sites exist for tour operators and guides, but compliance with guidelines is not monitored. Visitor flows are monitored on an ad hoc basis. Visitors do not received any specific guidance for their visit at the cultural site.	Tangible cultural assets have been identified and listed. Initial concepts for the evaluation of key cultural assets (e.g. including vulnerability) have been implemented, Dedicated laws are in place governing the proper sale, trade, display, or gifting of historical and archaeological artefacts. They are publicly communicated and compliance is infrequently monitored. System is in place for the management of visitors within and around cultural sites. Visitor flows are monitored manually. Guidelines for tour operators and guides are in place and being enforces. Some tour operators/ tour guides provide guidelines on visitor behaviour. Income from tourism is used for protection, restoration and conservation of cultural assets on a case by case basis.	Legislations, policies and a system are in place to rehabilitate and conserve cultural assets, including built heritage and cultural landscapes. Cultural assets are identified and evaluated, incl. indication of vulnerability and increase/decrease in threats and type to the original purpose and use of site (subjective classification). The destination has laws governing the proper sale, trade, display, or gifting of historical and archaeological artefacts. The laws are enforced and publicly communicated, including to tourism enterprises and visitors. The destination has a system for the management of visitors within and around cultural sites, which takes account of their characteristics, capacity and sensitivity and seeks to minimize adverse impacts. Sensors are used to continuously monitor visitor flows and to initiate mitigating actions, if needed. Tourist sites are geolocated in a dynamic online map for visitors to consult. Guidelines for visitor behaviour at sensitive sites and cultural events are made available to visitors, tour operators and guides before and at the time of the visit. Accurate interpretative material is provided which informs visitors of the significance of the cultural and natural aspects of the sites they visit, incl. the significance and sensitivity/fragility of sites. The information is culturally appropriate, developed with host community collaboration, and clearly communicated in languages pertinent to visitors and residents. There are mechanisms in place to use income from tourism for protection, restoration and conservation of cultural assets.	

Note: Contains exemplary ratings for illustration purposes

D - Destination Management

Overall Maturity Radar | Summary Destination Management | Current State Heatmap | Environmental | Economic | Socio-cultural

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
D1	Strategy	2	4	2	No or only basic destination management vision in place. No/ vaguely defined sustainability objectives. No process for stakeholder engagement/consultation.	Destination has a destination management vision and action plan, that is reviewed and updated infrequently. Vision and action plan are not aligned to wider sustainable development policy in the destination. Vision and action plan clearly define one or more objectives for economic, socio-cultural and environmental change in the destination. Few key stakeholders from industry and public authorities have been involved in the development of the destination management vision.	Destination has set up a destination management strategy that is regularly reviewed and updated. Strategy mentions wider sustainable development policy in the destination (including pursuit of the SDGs) and identifies one or more indicator in each of the three dimensions economic, socio-cultural and environmental. Implementation of indicators is regularly monitored and results are published to key stakeholders. Strategy has been developed with some consultation of key stakeholders (e.g. industry partners, key local government departments, local community, visitors). Strategy has been released to key stakeholder groups.	The destination has implemented a multi-year destination management strategy plan that is suited to its scale, aligns its goals to and influences wider sustainable development policy and action in the destination. The strategy includes an identification and assessment of tourism assets and clearly outlines economic, socio-cultural and environmental impacts and risks (incl. climate change adaptation). Strategy clearly defines development targets and links to a respective operation plan, incl. detailed actions, budgets (showing current and future funding sources), calendars and performance measurement indicators and protocols. Strategy clearly describes the widespread stakeholder engagement process for consultation and development. A regular review and update process of the strategy is defined. Implementation progress of development targets is monitored, recorded and published on a regular basis. Strategy is (in large parts) publicly available.	
D2	Development control	3	4	1	No/ only basic land use planning regulations in place. Reviews are rarely conducted/ sanctions are rarely carrier out. No process for stakeholder engagement/consultation.	Basic guidelines for land use planning have been implemented but do not include specific criteria tourism development control or climate change adaption. Reviews take place on an ad hoc basis. Few key stakeholders from industry and the public have been involved in the development of the guidelines.	Land use planning guidelines, regulations and/ or policies have been developed that include reference to climate change adaption. Environmental, economic, and socio-cultural impact assessments are required for major tourism developments. Initial concepts for tourism development control (e.g. maximum number of hotels/beds, density standards) have been implemented. Review procedures have been defined and are infrequently carried out, incl. sanctions of violations. Guidelines, regulations and/ or policies have been developed with some consultation of key stakeholders (e.g. local community organizations).	The destination has land use planning guidelines, regulations and/or policies which accommodate the consequences of climate change and control the location and nature of development, require environmental, economic, and socio-cultural impact assessment and integrate sustainable land use, design, construction, and demolition. Regulations include specific criteria for tourism development control, such as maximum numbers of hotels/beds, density standards, design controls, etc. and also apply to operations, including property rental and concessions for tourism purposes. Review procedures (e.g. site visits, evaluations) have been defined to ensure compliance with guidelines, regulations and policies. Zoning or site plan violations are being sanctioned. The guidelines, regulations and policies were created with public participation and are widely communicated and enforced. Evidence of communication and enforcement of the policies/regulations/guidance, at planning, development and implementation stages.	
D3	Data, information and monitoring	3	4	1	Limited data available that is stored and maintained in different locations. No/ little integration of information systems. Sustainability performance is not measured or reported using digital methods.	On the basis of existing platforms, a central data warehouse has been established where data is securely stored and maintained. Some standardized, technology-supported sustainability reporting (based on templates) is in place, ensuring stable reporting quality. Reporting can be used for limited predictive analyses, but is not detailed enough to be of true relevance for stakeholders.	Initial concepts for the implementation of a cloud based data platform have been developed. There are standardized tools in place to access internal, centralized data; links with external data are possible. First digital products and mobile solutions are established and connected to existing technology. Advanced analytical tools are in use to evaluate central data retrospectively, limited predictive capabilities are in place. Destination continuously reviews monitoring capabilities and defines business requirements to further develop data sets and foster availability of data in real time.	The destination has a data integration platform/ open data website where most recently available destination information, data and statistics is not only collected and compiled for research but also monitored and visualized for relevant studies and data analysis for correct decision-making, publication and communication. Systems are highly integrated and ensure a seamless data interchange between tourism stakeholders. Analytics dashboard is available and real time reporting is in place for real-time monitoring and response to socio-economic, cultural and environmental issues and impacts arising from tourism, based on defined targets and metrics. Data also allows for predictive analytics and scenario analysis. The use of data and relevance of information to different stakeholders is monitored regularly to determine business value and update data models and content. Concepts around machine learning and AI are being evaluated.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
D4	Connectivity	3	4	1	Insufficient internet connectivity and speed in most areas of the destination. Most points of interest and tourist attractions do not offer any Wi-Fi connectivity. Offering free Wi-Fi to guests is not a common practice for hotels, hostels and camping sites.	The destination has sufficient internet connectivity and speed in some areas. Few points of interest and tourist attractions offer free Wi-Fi. Few hotels, hostels and camping sites offer free Wi-Fi to guests. DMO does provide information on connectivity in the destination on an ad hoc basis.	The destination has sufficient internet connectivity and speed (at least 75% of the destination covered) thanks to fixed telecommunication networks. Some points of interest and tourist attractions offer free Wi-Fi. Some hotels, hostels and camping sites offer free Wi-Fi to guests. There is some information on connectivity in the destination available through the DMO offices. Initial concepts for the use of QR codes, beacons, etc. have been explored, but not yet implemented.	The destination has good internet connectivity and speed (at least 75% of the destination covered) thanks to fixed telecommunication networks. Most main points of interest and tourist attractions (including beaches, natural/thematic parks, monuments, historical sites, etc.) offer free Wi-Fi. Most hotels, hostels and camping sites offer free Wi-Fi to guests. The DMO website offers information on connectivity at the destination (e.g. a map with geolocation of free Wi-Fi spots). QR codes, beacons or other NFC technology have been implemented in main points of interest for tourist information provision.	
D5	Sustainability reporting and communication	3	3	0	No clear or visual reporting of sustainability actions or outcomes. Sustainability performance is hard to interpret.	Written evidence of monitoring and reporting of sustainability actions and outcomes on visual dashboard(s). A basic reporting is prepared for key stakeholders. No information on sustainability actions and performance is shared in RFP responses and sales information.	Regular public sustainability reporting in place (e.g. on DMO website). Key stakeholders receive more detailed reporting (e.g. standard dashboards) as basis for their decision-making. Sustainability strategy and performance is sometimes shared in RFP responses and sales information. Initial concepts for regular communication of sustainability and climate change related issues to tourism-related businesses have been implemented (e.g. through media, events, etc.).	Regular public sustainability reporting in place (e.g. in annual DMO or sustainability report) that employs an internationally-recognised framework. Key stakeholders have real-time access to reporting in a visual manner (e.g. dashboards), enabling them to focus on areas of greatest interest. Sustainability strategy and performance is always shared in RFP responses and sales information. A system for regular communication of sustainability and climate change related issues to tourism-related businesses has been established (e.g. through media, meetings, direct contact etc.).	
D6	Visitor satisfaction and interaction	4	4	0	There are limited actions in place to measure visitor satisfaction or no system is in place to analyse information and translate it into actions. Destination offers physical tourist offices. No designated destination website, visitor information might be included in website(s) of other public authorities (e.g. municipality).	Different initial concepts have been established to measure visitor satisfaction and initiate actions to improve tourism products and services (e.g. surveys from tourism establishments, attractions, etc.), but data is not integrated. Destination offers physical tourist offices and few other channels for visitor interaction (e.g. hotline). Destination has an official website, but it is not yet adapted to mobile devices. Initial concepts for regular visitor interaction (e.g. through newsletter) are being developed.	Visitor satisfaction is measured regularly (e.g. through a standardized exit questionnaire). Data is collected centrally to review effectiveness of implemented measures and to incorporate visitor feedback to further improve tourism experience and manage destination. Destination offers some different channels for interaction with visitors. Initial concepts to implement chatbots, etc. have been developed. Destination has active social media profiles that are being monitored regularly. Destination official website is adapted to main mobile devices. Website offers possibility to subscribe to destination newsletter, which regularly includes offers, discounts or promotions to subscribers.	A visitor-centric culture is embedded into the destination management organization. A robust set of tools is in place to consistently monitor and publicly report visitor needs/ feedback and initiate actions to continuously optimize of tourist touch points, enhance the visitor experience and streamline DMO's operations. Destination offers a variety of channels for interaction with visitors, e.g. 24/7 information points at the main tourist office of the destination, whatsapp number, chatbot or virtual assistant on website, videocalls. DMO personnel is qualified for social media management and manages and monitors social media profiles of the destination. DMO has implemented service level targets, e.g. to respond to all tourists' requests on social media within 24h. Destination has its own mobile app, offering added value for tourists (e.g. discounts, integrated options for transport, personalised travel planning and recommendations, downloadable material) and for the DMO (data to analyse tourist behaviour and preferences, cross-selling, etc.).	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
D7	Organization and governance	3	4	1	Destination management is not formalized. Some partnerships exist along the tourism value chain based on stakeholders' initiative.	Initial concepts for a dedicated organization for destination management have been implemented with basic funding and staffing. Records of permanent staff and contracted personnel exist, roles and responsibilities of the organization are loosely defined and documented. Loose partnerships have been formed with public or private sector around specific initiatives. Existence of an (informal) local tourism advisory board, but without defined structure or meeting schedule. Initial concepts for guidelines on sustainable procurement and suppliers practices have been implemented.	The destination has established an effective organization, department, group, or committee responsible for a coordinated approach to sustainable tourism, with involvement by the private sector, public sector and civil society. Private funds are allocated to manage and market the destination (public-private partnerships to fund actions and staffing). There is documentary evidence showing the relevant make-up and responsibilities of the group, that is communicated to staff and key stakeholders. Likewise, roles and responsibilities with respect to public and private sector are defined. Concepts have been implemented to ensure sustainable and transparent operations of the group. An issue-driven meeting structure is in place for meetings of the governing authority/board, management and committees. Existence of management guidelines and processes, which demonstrate awareness and adherence to sustainability principles and transparency in operations and letting of contracts.	The destination has established a DMO responsible for a coordinated approach to sustainable tourism, with involvement by the private sector, public sector and civil society. The DMO has clearly defined responsibilities, oversight, and implementation capability for the management of socio-economic, cultural and environmental issues. The DMO is adequately funded, works with a range of bodies in delivering destination management and has access to sufficient staffing (including personnel with experience in sustainability). The organizational structure or organization chart of the DMO is stated and documented. The functions and tasks in the DMO are clear and aligned with the destination strategy, communicated to stakeholders and internal staff. Likewise, the DMO defines its roles and responsibilities with respect to public sector actors in their diverse competences (national, regional and/or local), as well as to the private sector. The DMO follows principles of sustainability and transparency in all its operations and transactions. The DMO holds meetings of its governing authority/board, management and committees according to a defined schedule and implements an appropriate procurement policy and suppliers practices.	
D8	Capacity building, knowledge sharing and innovation	3	3	0	Lack of understanding of required skills and capabilities. No formal training programs in place. Stakeholder along the tourism value chain mainly operate in silos. Little focus on partnerships or knowledge sharing. Some small initiatives have been funded to explore innovative ideas, but no overall initiative is in place.	Basic understanding of capabilities and skills required for successful destination management. Basic training program in place that is mainly focused on leadership development. Onboarding of new staff is handled individually on an ad-hoc basis. Loose partnerships have been formed with stakeholders from public and private sector around specific initiatives. There is a small budget dedicated to innovation initiatives (e.g. support program for entrepreneurs), but no structures, processes and metrics for innovation have been formalized. Local tourism knowledge exchange occurs ad hoc, e.g. in the form of personal meetings.	Destination management group actively monitors human capital requirements for its own operations and regularly updates onboarding, training and talent development programs for its staff to close any potential capability gaps. Initial concepts are in place to develop and promote external training and skills development initiatives led or actively supported by DMO that are oriented on the destination strategy. Destination management group is part of an evolving public-private partner network with a focus on improving the tourism value chain and destination competitiveness. Initial structures, processes and metrics for innovation have been implemented by dedicated resources of the group (e.g. innovation awards, specialized trainings). Meetings between public and private stakeholders and experts (e.g. tourism companies, research centres or universities and institutions) are held at least once a year with the aim of developing innovative projects at the destination. There is a defined annual budget dedicated to fund innovation initiatives. Initial concepts (e.g.,. newsletter) have been developed to facilitate tourism knowledge exchange and communication between tourism stakeholders.	The DMO plays an active role in identifying and formulating relevant skills and tourism-related human capital requirement in the destination (incl. for its own operations). It encourages human resources development by promoting continuously updated training and skills development initiatives led or actively supported by DMO. DMO actively drives collaboration initiatives between tourism establishments and suppliers to improve the tourism value chain and established effective alliances with the private sector. The DMO engages in private-public partnership initiatives and also with government authorities that are involved in or affect the destination's competitiveness in alignment with the destination strategy. DMO carries out a program/ actions to promote entrepreneurial initiatives and innovations in tourism that is adequately funded and regularly reviewed based on a full set of defined innovation metrics. A private-public cross-industry partner network is used to enable shared value creation and boost innovation, accelerate learning and enable structural changes. Public events (such as seminars, workshops, fairs) open to any type of participant are held to foster innovation in tourism, at least once a year. There is an online platform that facilitates local tourism knowledge exchange and communication between tourism companies, suppliers and public organisations, especially focused on sustainability issues and measures.	

Note: Contains exemplary ratings for illustration purposes

ID	SUB-DOMAIN	RATING AS-IS	RATING TO-BE	GAP As-Is vs. To-Be	1 - BASIC	2 - PROGRESSING	3 - ADVANCED	4 - LEADING	COMMENTS
D9	Destination image, branding and marketing	2	3	1	Initial ideas around the destination brand have been developed, but not yet been formalized. No marketing plan incl. approach to online and social media marketing has been formalized. Marketing activities are carried out on an ad hoc basis, without structured monitoring or analysis. Promotion and visitor material in parts outdated and not linked to the destination's values or sustainability claims.	Initial concepts for destination brand and customer value proposition have been implemented. A basic tourism marketing plan is in place, but is not monitored or reviewed regularly or strategic approach is outdated. Initial concepts for online and social media marketing have been implemented, but there is no structured approach yet for Search Engine Marketing (SEM) activities or online campaigns. Web analytics tools are used on an ad hoc basis. Promotion and visitor material is being reviewed infrequently. Initial concepts have been implemented to reflect the destination's values and approach towards sustainability. Some tourism establishments inform visitors about sustainability issues and actions upon individual initiative.	Destination has implemented a brand strategy and defined a clearly articulated and supported customer value proposition. The DMO has developed their tourism marketing plan based on a sound strategic approach (e.g., market analysis, segmentation, definition of objectives, prioritization, return on investment, etc.) within the scope of its mandate. Scope of the marketing plan is reviewed and implementation of activates are monitored on a regular basis. A basic online and social media marketing plan is in place, that is reviewed regularly. The DMO infrequently invests in SEM activities and online campaigns. Web analytics tools are used infrequently to measure impact of activities and campaigns. Social media activities are monitored and analysed infrequently. Promotion and visitor information material is regularly updated to ensure information accuracy. Initial concepts have been implemented to link marketing messages and other communication to destination's values and sustainability claims. Initial concepts have been implemented to inform visitors sustainability issues in the destination and required actions.	Destination brand and customer value proposition are designed so that they can be regularly reviewed and adjusted to meet evolving customer requirements. The DMO has implemented a dedicated online and social media marketing plan that is being regularly reviewed. The online marketing plan involves public-private collaboration to promote the destination and local companies. The DMO regularly invests in SEM activities and online campaigns (e.g. incl. banners, pop ups, influencers, etc.). Web analytics tools and metrics (e.g. return of investment, impact) are in place for the regular measurement and monitoring of activities to support future decision-making in accordance with strategy and marketing plan. Qualified DMO personnel monitor and analyse regularly social media activity (incl. follower numbers) and generate reports. Promotion and visitor information material about the destination is accurate with regard to its brand, customer value proposition and sustainability claims. Marketing messages and other communications reflect the destination's values and approach to sustainability and treat local communities and natural and cultural assets with respect. Broad measures are in place to inform visitors about sustainability issues in the destination and the part that they can play in addressing them.	
D10	Risk and crisis management	3	4	1	Some guidelines on risk reduction, emergency response and crisis management exist without detailing of responsibilities. No review process for guidelines in place.	Destination has a basic risk reduction, emergency response and crisis management plan. Responsibilities are loosely defined. Plan is reviewed on an ad hoc basis. Plan is available to key stakeholders.	The destination has a formal risk reduction and emergency response plan with general accountabilities for crisis management. Plan is reviewed infrequently. Basic guidelines for crisis communication have been defined. Information about the plan is publicly available but not actively communicated to residents, visitors, and enterprises.	The destination has a formal risk reduction and emergency response plan that is appropriate to the destination. A crisis management plan with clearly defined roles and responsibilities is defined to coordinate the tourism sector in case of crisis. Plan includes a crisis communications plan.. Key elements are validated with relevant agents and communicated to residents, visitors, and enterprises. Required procedures and resources are established and the plan is regularly updated to account for changing demands.	

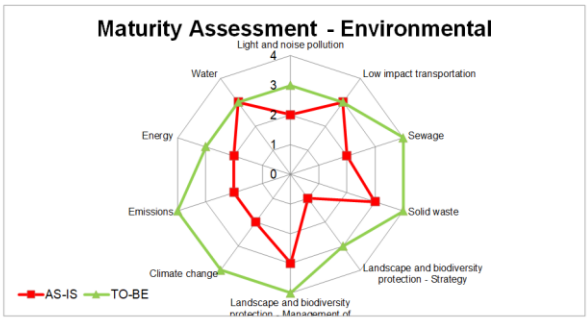
Note: Contains exemplary ratings for illustration purposes

Appendix F: Maturity assessment tool – Results visualization

A - Environmental

RATING

SUB-DOMAIN	AS-IS	TO-BE	GAP
Light and noise pollution	2	3	1,00
Low impact transportation	3	3	0,00
Sewage	2	4	2,00
Solid waste	3	4	1,00
Landscape and biodiversity protection - Strategy	1	3	2,00
Landscape and biodiversity protection - Management of natural sites	3	4	1,00
Climate change	2	4	2,00
Emissions	2	4	2,00
Energy	2	3	1,00
Water	3	3	0,00



Top areas for improvement

Emissions

The sub-domain that needs most improvement is Emissions where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

GHG emissions per capita (measured in tonnes of equivalent carbon dioxide unit) and share of tourism sector

Number of days exceeding air quality standards

Incidence of respiratory problems (local and tourist)

Number of health problems reported by tourists

Perception of air quality by tourists

Number of warnings regarding the air pollution of the destination in major publications and guidebooks (would be done by a survey of these print sources)

Cost of repair to buildings and cultural sites

Climate change

The second sub-domain that needs improvement is Climate change where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

% of tourist infrastructure (hotels, attractions, etc.) located in vulnerable zones

Value of tourism infrastructure in coastal zone below estimated maximum storm surge levels or equivalent

Value of damage to tourism sector annually due to storm events or flooding

% of tourism dependent on viewing species (% of key species considered vulnerable to changes in climate)

Landscape and biodiversity protection - Strategy

The third sub-domain that needs improvement is Landscape and biodiversity protection - Strategy where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

What is the city's green and blue area (hectares) per 100,000 population?

% of natural area coverage in the territory of the destination (change over time)

Number of sites damaged by other development

Cost of protection/restoration

Health of population of key indicator species (counts, sightings)

Sewage

The fourth sub-domain that needs improvement is Sewage where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

Number of reported pollution or contamination events per annum (by month) in watercourses receiving effluents

% of treated sewage recycled from tourism sector (e.g. for irrigation)

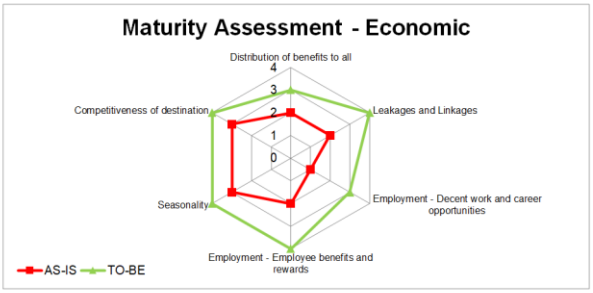
% of wastewater from the destination centrally treated to at least secondary level

Note: Based on exemplary ratings for illustration purposes

B - Economic

RATING

SUB-DOMAIN	AS-IS	TO-BE	GAP
Distribution of benefits to all	2	3	1,00
Leakages and Linkages	2	4	2,00
Employment - Decent work and career opportunities	1	3	2,00
Employment - Employee benefits and rewards	2	4	2,00
Seasonality	3	4	1,00
Competitiveness of destination	3	4	1,00



Top areas for improvement

Employment - Employee benefits and rewards

The sub-domain that needs most improvement is Employment - Employee benefits and rewards where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

- Average tourism employee income (and ratio to community average)
- % of tourism operators who provide day care and other benefits for employees with children
- % of operators who promote staff awareness of occupational health, safety and issues affecting female employees
- % of workplaces with family-friendly rostering (work shifts and rotation)
- % of tourism operators who provide transport for women returning from night shifts
- % of employees with employer sponsored comprehensive health insurance
- % of local tourism sector employees receiving free/subsidised health checkups and clinics for staff and family members
- % of employees in tourism establishments with access to healthy in house food services (canteens, cafeterias)

Employment - Decent work and career opportunities

The second sub-domain that needs improvement is Employment - Decent work and career opportunities where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

- Direct tourism employment as % of total employment in the destination
- % of workers directly employed by tourism businesses that are from the local community vs. from outside region or other countries
- % local workers employed at different skill levels (unskilled, technical, administrative, middle/senior management, contract)
- Ratio of men/ women of all tourism employment/ formal tourism employment/ informal tourism occupations
- % of tourism businesses run/registered by women
- % of jobs that are full time
- Employee satisfaction (questionnaire based)
- Retention levels of employees

Leakages and Linkages

The third sub-domain that needs improvement is Leakages and Linkages where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

- Value of imported goods for the tourism sector (construction materials, equipment, sundry)
- Value of imported services for the tourism sector (systems, software, consultants, experts, architects, etc.)
- Remittances of profits and dividends
- Remittances due to foreign debt servicing (originating from general tourism development loans and related to specific facilities/activities)
- Quantification of lost market/lost business value
- Number of tourism businesses in the community, and % owned locally
- Number and type of business permits and licences issued
- Asset value of tourism businesses and % owned locally

Competitiveness of destination

The fourth sub-domain that needs improvement is Competitiveness of destination where the average difference between your current position and your future ambition is 1

Inventory of relevant metrics:

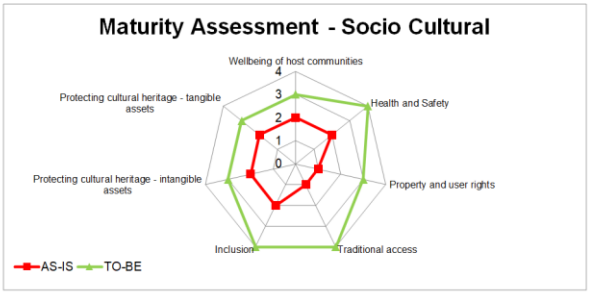
- Cost/Price ratios (including gross margin) of accommodation, attractions, tours or packages compared to industry norms or ratios for similar products at other destinations
- % of tourists attracted to destination because of unique features (questionnaire based)
- Expectations met or exceeded (questionnaire based)
- Value/price rating by tourists (questionnaire based)
- Ratings by guidebooks/travel sites
- Market share (compare to other destinations) – will require survey in tourist home locations

Note: Based on exemplary ratings for illustration purposes

C - Socio-Cultural

RATING

SUB-DOMAIN	AS-IS	TO-BE	GAP
Wellbeing of host communities	2	3	1,00
Health and Safety	2	4	2,00
Property and user rights	1	3	2,00
Traditional access	1	4	3,00
Inclusion	2	4	2,00
Protecting cultural heritage - intangible assets	2	3	1,00
Protecting cultural heritage - tangible assets	2	3	1,00



Top areas for improvement

Traditional access

The sub-domain that needs most improvement is Traditional access where the average difference between your current position and your future ambition is 3

Inventory of relevant metrics:

Access by locals to key sites (% of sites freely accessible to public)

Frequency of visits by locals to key site(s)

Cost of access expressed in hours of local wages

Perception of change in accessibility due to tourism growth

Number of complaints by local residents regarding access

Inclusion

The second sub-domain that needs improvement is Inclusion where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

% of tourist attractions that are accessible to people with disabilities and/or participating in recognised accessibility information schemes

% of public transportation facilities (including e.g., airports, piers, bus stations) meeting standards with regards to disabled access

Number(%) of public transport vehicles suitable for mobility of persons with disabilities

% of rooms in commercial accommodation accessible to persons with disabilities (easy access, bathrooms that accommodate wheelchairs, safety bars etc.)

Number(%) of access doors to public buildings which have automated openers or attendants on the door

% restaurants, hotels and public buildings with wheelchair accessible restrooms (level entry, larger stalls, lower sinks, safety bars etc.)

Number of tours to destination with specific program to accommodate persons with disabilities

Number of tour companies in destination offering tours/guides trained for persons with disabilities

Property and user rights

The third sub-domain that needs improvement is Property and user rights where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

% women/men with rights to land in tourism development areas

% women/men holding rights to tourism leases

% bank loans issues to women/men for tourism ventures

% women/men defaulting on bank loans

% donor grants issued to women/men for tourism ventures

Health and Safety

The fourth sub-domain that needs improvement is Health and Safety where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

Number of illness, accidents and death cases of tourists and the cause

Number (%) of tourists reporting health problems

% of tourists who register a complaint with the police

Number of workplace accidents (and cost of compensation)

% tourism employees (male/female) suffering increased fatigue and stress as a result of work

% of commercial food outlets (as above) with adequate temperature control for commercial food storage

% of commercial food outlets including street vendors with provision of adequate hand washing facilities for food handlers (number of violations)

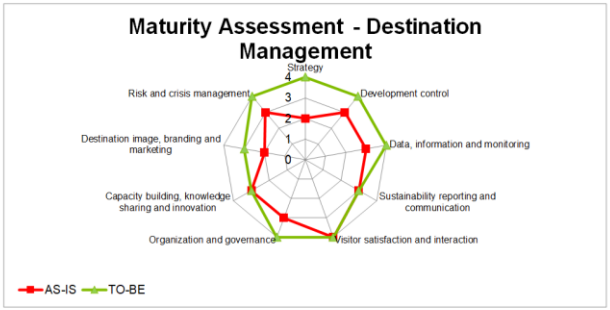
Types of tourism operations involved in cases/outbreaks of food poisoning (number)

Note: Based on exemplary ratings for illustration purposes

D - Destination Management

RATING

SUB-DOMAIN	AS-IS	TO-BE	GAP
Strategy	2	4	2
Development control	3	4	1
Data, information and monitoring	3	4	1
Sustainability reporting and communication	3	3	0
Visitor satisfaction and interaction	4	4	0
Organization and governance	3	4	1
Capacity building, knowledge sharing and innovation	3	3	0
Destination image, branding and marketing	2	3	1
Risk and crisis management	3	4	1



Top areas for improvement

Strategy

The sub-domain that needs most improvement is Strategy where the average difference between your current position and your future ambition is 2

Inventory of relevant metrics:

- % of plan objectives which have been met
- % environmental, social, cultural actions recommended in plan which have been implemented
- Budget designated/spent for research and formulation of the strategy
- Budget designated/spent for plan implementation
- Budget designated/spent for consultation and public participation
- Level of staff resources assigned to planning

Risk and crisis management

The second sub-domain that needs improvement is Risk and crisis management where the average difference between your current position and your future ambition is 1

Inventory of relevant metrics:

- % of tourists who fear travel to the destination (questionnaire based)
- Number of incidents (per month, per annum and per types of incidents)
- Frequency of mention of destination (or region) in international news of incidents (per media type)
- Warnings about precautions and vaccinations (% of travellers receiving vaccinations before arriving at destination)
- Effectiveness of surveillance and reporting of cases (number of air travellers arriving/departing identified as infected; number of reported cases at the destination)
- Number of tourism businesses distributing health warning information to customers
- Number of businesses undertaking voluntary quarantine procedures such as sending any ill staff to medical centre
- % of staff/ travellers provided with information on effective personal protection and socially responsible behaviour to avoid transmission of diseases

Destination image, branding and marketing

The third sub-domain that needs improvement is Destination image, branding and marketing where the average difference between your current position and your future ambition is 1

Inventory of relevant metrics:

- % of tourists who have a positive image of the destination (questionnaire based)
- % of tourists who would recommend the destination to their peers (questionnaire based)
- Rank of destination on list of destinations (key competitors) on broad surveys in key market(s)
- % of key actors (hotels, attractions, partner organizations) whose marketing carries the brand features (logo, slogan, etc.), or uses complementary images
- Percentage of stakeholders surveyed who believe the branding programs help improve the value and performance of their tourism operations
- Percentage of visitors who believe the brand values, attributes and benefits communicated were met during their trips; recall the brand name (on same day, in longer term); attribute the brand features (name, logo, etc.) solely to the destination
- Digital marketing KPIs focusing on sustainability related marketing and communications, e.g. website traffic; time on site; page views; cost; leads; conversion rate; newsletter subscribers; followers and fans; post reach; keyword rankings; ROE; ROI
- % clients who arrive in response to specific ads or initiatives (reservations, return of promotional coupons, poll source of information on arrival)

Organization and governance

The fourth sub-domain that needs improvement is Organization and governance where the average difference between your current position and your future ambition is 1

Inventory of relevant metrics:

- Degree of stakeholder participation in the process of implementing plans (numbers/% involved in review, advisory panels etc)
- Involvement of stakeholders in tourism development activities of tourism office (% of activities, number involved)
- % public sector employees with tourism training
- Frequency of community meetings and attendance rates (% of eligible who participate)

Note: Based on exemplary ratings for illustration purposes

Appendix G: Semi-structured interviews – Synopses

Interview I

Interviewee name:	Duarte Padinha
Profession:	Tourism Stakeholder
Entity:	Região de Turismo do Algarve (Algarve Tourism Board)
Position:	Director of Operations
Interview location:	Online (Zoom)
Date:	24/03/2023
Duration:	1 hour

Discussion of four dimensions:

Simplicity:

- *Is the model designed in such a way that is it clearly and easily understood?*

A: Model presentation was straight forward, basic framework is easily understood

Coverage and Completeness:

- *Does the model adequately address all relevant dimensions of sustainable tourism?*
- *Does the model adequately address all relevant sub-domain per dimension?*
- *Is the allocation of sub-domains to dimensions adequate?*

A: The four dimensions incl. destination management are supported and match the own view of the interviewee; sustainability is hereby not seen as a "flat triangle", but destination management is an important element in order to coordinate the key issues. Technology is an important and transversal factor (as can be seen in the Smart Tourism initiative that is part of the Algarve Smart Region project, currently in its conceptual phase).

- *Does the model adequately delineate the maturity levels?*
- *Are the maturity level descriptions clear and complete?*
- *Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, ...)?*
- *Does the model adequately address all the different stakeholders in a tourism destination?*
- *Does the model apply to all types of tourism destinations?*

Not discussed due to time constraints

Usefulness:

- *How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?*
- *Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?*

- *What are the main strengths of this model?*
- *Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?*

A: Concept is perceived as very interesting and important for Algarve and Portugal as a whole, especially as it enables the articulation of strategic priorities.

As a small destination with limited resources there is a high dependency on tourism and hence European funding. As these fundings are becoming more and more scarce, guidance to develop the right priorities is needed. Currently these priorities are developed based on the marketing plan, with hopes are that in the future data from the Regional Observatory can support decision-making. As it is foreseeable that funding in the future will be connected to certain metrics/ indicators, an application of the model across Portugal or Europe could help to establish benchmarks to be used by destination for the articulation of priorities.

As an additional aspect, in a region with limited resources, priorities need to be adjusted to what funding is available. It would be great if the model would help to address this.

Implementation:

- *What could be the main difficulties of implementation of this assessment tool?*
- *What could be risks?*

A: "You cannot manage what you can't measure" (Drucker) – for the formulation of priorities, details and timely information is needed. Question is raised how the model supports that? How long would it take to gather all required data? What would it cost?

Stakeholders in the tourism sector come from very different areas (e.g. private and public sector) with different priorities, not always are these convergent. In addition, regional development and tourism development often have two different perspectives.

- *What do you think are success factors for a successful implementation of the assessment tool?*
- *How to overcome the identified implementation difficulties and risks?*

A: An appropriate coordination/ management of the framework is needed, e.g. to determine which information to get from where, who would pay for it, etc.

Section 4 – Session Evaluation and Closing

- *Have I missed anything – is there anything else you think I should ask?*
- *Do you have any suggestions for the improvement of the validation technique?*
- *Would you like to make any other comments?*

A: Technology focus brings along a lot of new opportunities, e.g. to really understand visitor flows and behaviour based on mobile data, but currently there are still some open questions that need to be addressed, such as

- How to manage all of this data → appropriate treatment of data in order to transform it into useful information
- Change of mindset and capacity building needed

Interview II

Interviewee name:	Aquiles Marreiros
Profession:	Tourism Stakeholder
Entity:	Comissão de Coordenação e Desenvolvimento Regional do Algarve (CCDR)
Position:	Member of the steering committee of the Algarve 2030 program management authority
Interview location:	Faro
Date:	29/03/2023
Duration:	1.5 hours

Discussion of four dimensions:

Simplicity:

- *Is the model designed in such a way that is it clearly and easily understood?*

A: Interviewee has previous experience with sustainability assessments, such as indicator models. But even without that, the model was perceived as objective and the contents were found to be clear and easy to understand for different stakeholders.

Coverage and Completeness:

- *Does the model adequately address all relevant dimensions of sustainable tourism?*

A: The dimensions applied in the model were found adequate and aligned to international sustainability agendas, incl. EU regulations and sustainability focused assessments.

- *Does the model adequately address all relevant sub-domain per dimension?*

A: Existing sub-domains were perceived as adequate, however some suggestions for extensions of the sub-domains were made:

Environmental dimension:

- Circular Economy concept was highlighted as transversal element, not only for the sub-domain *Solid Waste*, but also for e.g. *Sewage, Water, Energy, Emissions*. Funding and support for tourism companies to develop their capabilities in this regard, e.g. through the set-up of adequate water treatments systems is seen as relative characteristic for higher levels of maturity

Economic dimension:

- Cohesion with social rights on national and supra-national level (here: EU), e.g. with regards to worker's rights and fair remuneration was mentioned as

potential characteristic to be added with regards to the sub-domain Employment
- In addition, Education and Qualification of Employees was highlighted as critical aspect in the sub-domain Employment, as this factor has impacts on tourism service quality and hence customer satisfaction in the destination. A targeted support of selected higher education and professional qualification programs focused on tourism was mentioned as potential criteria to achieve a higher level of maturity in this regard.

Socio-cultural dimension:

- Housing, in particular the increased use of real estate for tourism and related impact on affordability and availability of housing, as well as overall impacts created by gentrification for residents was suggested as relevant aspect to be included in this dimension. This aspect was also seen as linked to the sub-domain Employment in the Economic dimension, as a lack of affordable, quality housing may impact the ability to attract qualified workers for the tourism sector in a destination.

Destination Management dimension:

- The development and implementation of a Mobility strategy and programs was mentioned as relevant aspect with regards to the management of destinations. Especially in a region as the Algarve, where Faro airport is the central arrival point for tourists residing in the different coastal towns, such as Albufeira, Vilamoura, etc., a mobility program is crucial to provide an enhanced tourism experience and increase efficiency. Programs are currently rolled out in line with the 2030 planning and are linked to the criteria of Low Impact Transportation.
- Connectivity was perceived as an ambiguous term in this dimension, as it could be confused with aspects around mobility

- *Is the allocation of sub-domains to dimensions adequate?*

A: Allocation of sub-domains to dimension was found aligned to international sustainability agendas.

- *Does the model adequately delineate the maturity levels?*

A: Delineation of maturity levels was perceived clear and objective

- *Are the maturity level descriptions clear and complete?*

A: Description of maturity levels was perceived clear and complete

- *Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, ...)?*

A: Model was perceived to adequately address all tourism subsectors as well as different tourism products, e.g. events, nature-based tourism, sports

- *Does the model adequately address all the different stakeholders in a tourism destination?*

A: Model was perceived to adequately address and be understandable for all different tourism stakeholder groups

- *Does the model apply to all types of tourism destinations?*

A: The model is, in principle, perceived to apply to all types of tourism destinations. Interviewee argued that while the Algarve is generally considered as a sun & beach destination, it holds some characteristics of other destination types, e.g. with regards to nature-based tourism, rural tourism, creative tourism. All of these aspects could be covered with the model. Nevertheless, interviewee notes that there might be differences in the relative importance of the sub-domains for different types of tourism destination: using the example of Fatima as a religious destination, seasonality might not be too severe as it is a year-round destination, however issues like housing, employment, etc. are similar to, e.g. the Algarve. As potential for further development of the model, interviewee noted the possibility to add a viewpoint on different destination types and the sub-domains and indicators most relevant for them.

Usefulness:

- *How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?*

A: Model was overall perceived as well aligned with existing international sustainability agendas and assessment tools on EU level and hence showing a high usefulness for practitioners.

- *Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?*
- *What are the main strengths of this model?*
- *Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?*

A: Dynamic approach resulting from of the maturity model concept was seen most relevant aspects and differentiating factor of the model, as it allows for re-adaptation and continuous development of destination targets.

Implementation:

- *What could be the main difficulties of implementation of this assessment tool?*

A: Equal availability of data and data quality for all dimensions were mentioned as difficulties for the implementation of the model and assessment of maturity levels. Data often comes from different sources and has different levels of segregation, e.g. some is on national level, some on local level. Additionally, in a region such as the Algarve, using average values, e.g. with regard to water consumption, waste, etc. can be misleading as there are large regional differences between the coastal, main touristic zone and the inland zone. The same argument applies when using per capita values, however this is accelerated by the effects of seasonality and

hence major variations in capita numbers over the year. Right scope of data needs to be found in order to inform the right decisions.

- *What could be risks?*

A: Biggest risk for the successful implementation of the model is seen to lie in resistance to change from stakeholders and lack of required mindset and hence acceptance of the relevance of assessment results from policy-makers.

- *What do you think are success factors for a successful implementation of the assessment tool?*

A: Interviewee argued that a change of culture and mindset within the tourism organizations and agencies is needed to start viewing the sector in a "non-traditional way". Tourism stakeholders (practitioners and policy makers) need to understand that good data can help to support good decision-making. They need to truly engage with the model in order to understand the opportunities arising from it and understand the operational implications of the results for their own area of responsibility. Interviewee pointed out, that the model therefore needs to be sold to tourism stakeholders as a service, highlighting what they can gain from its application.

- *How to overcome the identified implementation difficulties and risks?*

A: From the interviewee's personal point of view, a change in leaders is needed. Leaders of the future need to truly engage with the challenges of society and the tourism sector and drive new approaches. To overcome resistance to change from existing leaders, especially withing the policy-making process, an implementation of the model might need to be accompanied by a change management approach.
Finally, as a potential further development of the model, the introduction of standardized indicators was suggested to ensure the necessary availability and quality of data for the maturity assessment.

Section 4 – Session Evaluation and Closing

- *Have I missed anything – is there anything else you think I should ask?*
- *Do you have any suggestions for the improvement of the validation technique?*
- *Would you like to make any other comments?*

A: Within the smart specialization initiative applied in the Algarve, it has become apparent that one of the main challenges of the tourism sector is to transfer knowledge and innovation to all stakeholders, especially the tourism organizations. Knowledge sharing and engagement of different stakeholder groups is hence seen as a critical aspect for the development of a destination and to build critical capacities for sustainability and destination competitiveness.

Interview III

Interviewee name:	Hugo Nascimento
Profession:	Tourism Stakeholder
Entity:	Agência Regional de Promoção Turística do Algarve (ATA)
Position:	Executive Director
Interview location:	Faro
Date:	30/03/2023
Duration:	1 hour

Discussion of four dimensions:

Simplicity:

- *Is the model designed in such a way that is it clearly and easily understood?*

A: Yes, model is clear. Most important part is graphical visualization of results; if the graphics are clear, contents are easily understood. Interviewee pointed out how relevant dashboards/ simple visualization of key results are on management level. People only have a short time to grasp the key points, often data that they work with in practice is scattered from different sources, so it is important to bring everything together with the right focus.

Coverage and Completeness:

- *Does the model adequately address all relevant dimensions of sustainable tourism?*
- *Does the model adequately address all relevant sub-domain per dimension?*
- *Is the allocation of sub-domains to dimensions adequate?*
- *Does the model adequately delineate the maturity levels?*
- *Are the maturity level descriptions clear and complete?*
- *Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, ...)?*
- *Does the model adequately address all the different stakeholders in a tourism destination?*
- *Does the model apply to all types of tourism destinations?*

A: Dimension and sub-domains cover the scope of sustainability well. For the Destination Management dimensions, interviewee noted that the responsibilities for the sub-domains might be split in different authorities in the destination (like in the Algarve, with shared responsibilities e.g. from ATB, CCDR and ATA), not necessarily are they all covered by one DMO entity.

Maturity level and delineation is perceived adequate. A level "zero" could be added to consider completely new tourism destinations; however this is not regarded as a major added value for the model.

Model is perceived to cover all tourism subsectors and address all different stakeholders. Applicability to all types of tourism destinations is supported.

Usefulness:

- *How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?*
- *Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?*
- *What are the main strengths of this model?*
- *Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?*

A: Model is perceived as very useful as operational tool for the authorities managing all of the interconnected elements of tourism in a destination

Implementation:

- *What could be the main difficulties of implementation of this assessment tool?*
- *What could be risks?*
- *What do you think are success factors for a successful implementation of the assessment tool?*
- *How to overcome the identified implementation difficulties and risks?*

A: Resistance of local entities and lack of funding are seen as the main difficulties for implementing the model in a destination. In order to get stakeholders' buy-in, it needs to be highlighted what the goals of the assessment are, and which direct or indirect benefits result for the different stakeholders.

Section 4 – Session Evaluation and Closing

- *Have I missed anything – is there anything else you think I should ask?*
- *Do you have any suggestions for the improvement of the validation technique?*
- *Would you like to make any other comments?*

A: Everything was covered.

Interview IV

Interviewee name:	Prof. Pedro Pintassilgo
Profession:	Tourism Expert
Entity:	University of Algarve
Position:	Professor, Faculty of Economics (focus: Sustainable Tourism, Economics and Quantitative Methods)
Interview location:	Online (Zoom)
Date:	04/04/2023
Duration:	1 hour

Discussion of four dimensions:

Simplicity:

- *Is the model designed in such a way that is it clearly and easily understood?*

A: Yes, model is clear and can be easily understood.

Coverage and Completeness:

- *Does the model adequately address all relevant dimensions of sustainable tourism?*

A: Yes, the model covers the most relevant dimensions (i.e. the three "classical" dimensions environmental, economic and socio-cultural sustainability plus the fourth dimension regarding institutional sustainability).

- *Does the model adequately address all relevant sub-domain per dimension?*
- *Is the allocation of sub-domains to dimensions adequate?*

A: The sub-domains in each dimension have been well approached. Equal weighting of sub-domains in the basic model and hence use of average values for the assessment of maturity levels per domain was supported by the interviewee.

- *Does the model adequately delineate the maturity levels?*
- *Are the maturity level descriptions clear and complete?*

A: Delineation of maturity levels was perceived as adequate and level descriptions as clear.

A level "zero", as an infant stage could be added to consider completely new tourism destinations; however there the selection of four level is considered reasonable and perceived to represent the real-life situation well.

- *Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, ...)?*
- *Does the model adequately address all the different stakeholders in a tourism destination?*

A: Some of the sub-domains are perceived to be more broadly focused on the destination, some may apply more on sectorial level (accommodation, restaurants, transport, events and attractions, etc.); however overall the model is perceived to adequately address all subsectors, as well as stakeholders.

- *Does the model apply to all types of tourism destinations?*

A: The model was perceived as sufficiently general to be applied for all destination types.

Usefulness:

- *How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?*
- *Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?*

A: Model was found to be very interesting and tackling a very relevant topic for tourism in practice, application of maturity model concept to the field of sustainable tourism is considered a new approach with huge perceived academic potential.

- *What are the main strengths of this model?*

A: The model is very good to show what can be done and what are the potentials; for implementation, some practical aspects need to be considered, that should, however, not be seen as limitations to the model *(see D. Implementation)*

- *Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?*

A: Model outputs were perceived as very helpful for tourism practitioners and to give clear indications for the sustainable management of destinations. Maturity framework is considered to hold a very interesting potentials for application in practice.

Implementation:

- *What could be the main difficulties of implementation of this assessment tool?*
- *What could be risks?*

A: As with all models, their aim is to simplify reality, hence when applying them in practice, there might be a need to put a weighting on different sub-domains, depending on the destination's specific requirements.

Availability of data for the assessment needs to be considered.

In addition, some guidance for the metrics recommended as part of the model results might be needed (e.g. what could be potential benchmarks?)

- *What do you think are success factors for a successful implementation of the assessment tool?*
- *How to overcome the identified implementation difficulties and risks?*

A: Interviewee put forward the idea to, as part of the further development of the model, align the model's sub-domains with indicators that are already in use in the

destinations, e.g. from the network of Sustainable Tourism Observatories. It was highlighted that indicators used need to focus on added value and not be too demanding to be produced and maintained. In addition, historical development of metrics may be considered for each destination, allowing an internal comparison of results over time, in addition to a potential external comparison to other destinations.

Section 4 – Session Evaluation and Closing

- *Have I missed anything – is there anything else you think I should ask?*
- *Do you have any suggestions for the improvement of the validation technique?*
- *Would you like to make any other comments?*

A: No additional comments. In summary, model is perceived to be very interesting and practical, with huge academic potential.

Interview V

Interviewee name:	Prof. Hugo Pinto
Profession:	Tourism Expert
Entity:	University of Algarve
Position:	Professor, Faculty of Economics (focus: Regional and Urban Economics)
Interview location:	Faro
Date:	12/04/2023
Duration:	1 hour

Discussion of four dimensions:

Simplicity:

- *Is the model designed in such a way that is it clearly and easily understood?*

A: The model is found clear and easy to understand. Due to its simplicity and straight-forward framework, it is perceived to be easily implemented. Within a half-day or full-day workshop, the destination could leverage the model for an exploration of the topic of sustainability and to open a discourse of relevant stakeholders.

Coverage and Completeness:

- *Does the model adequately address all relevant dimensions of sustainable tourism?*
- *Does the model adequately address all relevant sub-domain per dimension?*
- *Is the allocation of sub-domains to dimensions adequate?*

A: Yes, all relevant dimensions of sustainability are covered. While destination management could be seen as a transversal dimension, it is perceived beneficial to be added as a separate dimension in order to receive the required focus and attention.

It was noted that based on the specific preconditions of a destination, it might be useful to adjust the order of sub-domains based on relative importance, however, as this entails an element of subjectivity, this approach might also have normative side-effect that would direct the discussion in a certain direction. Similarly, it was commented that, based on the target audience the model is presented to, the sub-domain labels might need to be adjusted to target-specific wording, or a glossary could be provided that gives a short summary of what is included in each sub-domain and the related metrics.

For the socio-cultural dimension, the aspect of property in relation to common goods (e.g. impact of gentrification, increase in prices, etc. on resident) was highlighted as especially important.

- *Does the model adequately delineate the maturity levels?*
- *Are the maturity level descriptions clear and complete?*

A: Yes, delineation of maturity levels is clear and adequate.

- *Does the model adequately address all tourism subsectors (e.g. accommodation, entertainment, ...)?*
- *Does the model adequately address all the different stakeholders in a tourism destination?*
- *Does the model apply to all types of tourism destinations?*

A: Model framework is perceived to give a broad enough coverage for all types of tourism destinations, encompassing all different tourism products and stakeholders.

Usefulness:

- *How do you perceive the usefulness for tourism practitioners with regard to sustainable management of a destination?*
- *Do the results the model offers clearly point out problem solving directions for tourism practitioners with regard to sustainable management of a destination?*

A: Maturity model is an interesting approach with very useful potential for the future, especially for the evaluation stage as part of the planning cycle. As noted in the beginning, model can be easily implemented for an exploration of sustainability in a destination; following this, specific actions can be developed in a participatory approach, also including peer reviews and benchmarks.

Further development of the model could consider the inclusion of a suggested "portfolio of activities" based on the destinations' current maturity level and desired future state in each dimension and sub-domain. Such portfolio of activities could help to depict a roadmap for the transformation of the destination towards sustainable development.

In addition, the development of a chain of events (based on theory of change) could be an interesting angle to advance the model as a tool for the evaluation of different actions or scenarios and to transcend the purpose of a momentary evaluation towards continuous monitoring and improvement.

- *What are the main strengths of this model?*
- *Taking into account that today several other ways of measuring sustainability in tourism destinations exist, do you find this particular model useful?*

A: Delineation of maturity levels helps to reflect reality and can be connected to the concept of destination life cycle. It helps to assess what is already there and what capabilities need to be developed in order to move to the next level of maturity. It can help destinations to understand that development towards a leading stage is not defined by growth and economic advances, but that a critical perspective on sustainability needs to be established to ensure all dimensions of tourism are managed in a way so that "predatory" effects of tourism are being avoided.

Interviewee further noted that it is inherent in the maturity level concept that lower levels have needs for bigger changes and improvements as sustainability still needs to gain legitimacy, whereas in higher levels, improvement needs are smaller, and it is more about refining what sustainability actually means and which areas to focus on for further investments.

Implementation:

- *What could be the main difficulties of implementation of this assessment tool?*
- *What could be risks?*

A: Interviewee noted what is not an issue of the model, but of reality, i.e. that those destinations in a very low maturity level are suspected to be the ones least interested in the topic of sustainability, as they solely might want to focus on economic growth. Destinations who are in the more advanced stages of maturity, however, will be interested in the topic, but will already have a range of models and tool in place for evaluation and monitoring.

Secondly, interviewee noted the risk of not sharing results and hence not gaining trust by the tourism stakeholders as relevant risks to be avoided during implementation.

- *What do you think are success factors for a successful implementation of the assessment tool?*
- *How to overcome the identified implementation difficulties and risks?*

A: Regarding the second point mentioned above, interviewee noted the need to provide a results review in short succession of any participatory processes (workshops, etc.) and to show public accountability by making results publicly available and visible. To gain stakeholders' trust, thorough stakeholder management and involvement is recommended, including the transparency about the goals and overall agenda so that a consensual vision can be developed.

Section 4 – Session Evaluation and Closing

- *Have I missed anything – is there anything else you think I should ask?*
- *Do you have any suggestions for the improvement of the validation technique?*
- *Would you like to make any other comments?*

A: For further development of the model, a potential cross-referencing to the UN's sustainable development goals was suggested.

In addition, it was recommended that the introduction of the model to destination stakeholders could be accompanied by a preliminary overview of results from existing indicator databases (e.g. Eurostat) to give some context and create attention for the sustainability dimensions.