

The background of the entire page is a photograph of a dark asphalt road stretching into the distance, flanked by snow-covered evergreen trees. The sky above is a deep, dark blue, filled with numerous stars and a few brighter, out-of-focus light sources, suggesting a clear night sky.

Aalborg University
Tourism – Master's Degree Programme
Master's Thesis

Transforming darkness: Initiation of astrotourism in North-western Denmark

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Number of characters: 214646

May 2023

Abstract

This master thesis addresses issue of North-western Jutland, Denmark, due to the region's strong dependency on seasonality in the context of tourism. During summer, the area is considered a tourist paradise, but colder months show a critical decline in the number of visitors. To solve the issue of seasonality in North-western Jutland, this thesis proposes an introduction of astrotourism that could contribute to the region's tourism development. The selected area has an exceptional quality of natural dark skies, which makes it eligible to organise different astrotourism experiences in order to attract guests all year-round. As light pollution is a growing global issue, focusing on the remaining dark skies is presented as the project's goal to raise awareness around this topic.

This research utilises both primary and secondary data. Secondary data is used to analyse the quality of the night sky in the selected region, but also to analyse the vision for development of the area, which is represented by two DMOs – Destination Limfjorden and Destination Nordvestkysten. Primary data collection consists of three phases: conversation with the CEOs of the two DMOs, 17 structured in-depth interviews and field observations of three stargazing tours.

The analysis reveals that both DMOs focus on sustainable development and are open towards new initiatives that contribute to the economic growth of the area's tourism sector. The analysis of the 17 structured interviews demonstrates that people perceive darkness as a valuable resource, which leads to unexplored opportunities that could help tourism development in North-western part of Denmark. Lastly, the analysis of three guided tours reveals success of realisation of astrotourism-related activities in the area and confirms a growing interest in this kind of tourism among general public.

In conclusion, this master thesis contributes with new findings that have the ability to contribute tourism development in North-western Jutland. Despite it being underappreciated among Danish policies, the analysed data shows that darkness is perceived as a value that argues for the importance of astrotourism's introduction as a solution to increase the number of visitors during the low season in the selected region. Furthermore, a suggestion for place branding and marketing strategies using darkness as a unique selling proposition in the area is presented as a solution to the project's case study.

Table of Contents

Introduction.....	6
Literature review.....	10
What is astrotourism?	11
Multiple roles of a DMO.....	13
Tourism development	16
Light pollution as a threat.....	17
A new report on light pollution	22
Case of sky protection and its meaning for tourism on the Canary Islands	23
Light pollution and sustainability	24
Astrotourism as an opportunity for season expansion in Denmark	25
Theoretical approach.....	27
Experience economy in tourism	28
Co-creation of the experiences.....	33
Place branding	35
Marketing Mix	38
Philosophy of science	40
Research paradigm.....	40
Ontology	41
Epistemology	42
Methodology.....	42
Research design.....	43
Data collection	44
Primary data	44
Secondary data.....	47
Analysis	49
Light Pollution in Denmark.....	50

“The dark Jutland”	53
Light pollution levels in North-western Jutland.....	57
Analysis of the DMOs	58
Destination Nordvestkysten	58
Destination Limfjorden	64
Analysis of the interviews	68
Thematic analysis of the interviews	69
Astro Safari in Bulbjerg	76
Development of North-western Jutland using concepts of astrotourism	81
Creating value with darkness to attract tourists	81
Place branding	85
Marketing.....	90
Discussion.....	95
Conclusion	98
References.....	100

List of figures

Figure 1. Definition of the research area in North-western Denmark	10
Figure 2. Categories of astrotourism.....	12
Figure 3. The different roles of a DMO	14
Figure 4. DMO analysis framework	15
Figure 5. The components of the light pollution.....	18
Figure 6. Hong Kong's skyline during the Earth Hour in 2013.....	21
Figure 7. The progress of the economic value	28
Figure 8. A model of satiable needs and negative marginal utility	30
Figure 9. Pierce's TCL model	32
Figure 10. Tourism experience network in the home-experience environment.....	34
Figure 11. Tourism experience network during the travel decision-making process	34
Figure 12. Tourism experience network away from the home environment	35
Figure 13. Visualisations of the analysis' structure	49
Figure 14. Light pollution map of Denmark.....	51
Figure 15. Light pollution map legend	54
Figure 16. Using Bortle Scale to define magnitude of the sky brightness.....	54
Figure 17. Light pollution map of Jutland and islands	55
Figure 18. Light pollution map of Funen and islands.....	56
Figure 19. Light pollution map of Zealand and islands	56
Figure 21. Light pollution map of the North-western Jutland	58
Figure 22. Number of overnight stays in Destination Nordvestkysten in 2022.....	60
Figure 23. An invitation to stargazing tours by Destination Nordvestkysten during Easter....	63
Figure 24. Number of overnight stays in Destination Limfjorden divided into the three municipalities.....	64
Figure 25. Number of overnight stays in Destination Limfjorden in 2022	66
Figure 26. TCL model of interviewees' motivation factors.	71
Figure 27. E-mail feedback from Destination Nordvestkysten after arranged guided tours ...	78
Figure 28. Division of 45 guests into groups.....	78

“... only when it is dark enough, can you see the stars.”

Martin Luther King, Jr, 1968 (AFSCME, n.d.)

Introduction

Back in the 1960s and 1970s, when the community of amateur astronomers started to grow, people quickly realised the increasing problem of light pollution, which forced them to travel to remote areas to experience the unpolluted night skies (Parkerson, 2018). Already back then, the city of Flagstaff, Arizona, became a pioneering community by raising awareness of light pollution and the importance of darkness in order to save the night skies, which was followed by many other cities and communities around the world (C+W Energy Solutions, 2019). This is how an extremely niche tourism, the so-called Dark-Sky tourism, was born as part of the foundation of The International Dark-Sky Association in 1988 – where people travelled to different places around the world to enjoy stargazing under unpolluted dark skies (C+W Energy Solutions, 2019). But as the globalization and interconnection of our world continued, Dark-Sky tourism can no longer be seen as a niche sector in tourism. Travelling to experience the dark skies rather grew into a new travel-trend, called astrotourism, a realisation of which can offer many growth opportunities both for local and global communities. Although, recent studies showed that light pollution is still a growing major problem that lacks attention in our modern world, even though we focus more and more on sustainable development (Falchi & Bará, 2023). Therefore, the main motivation of this master thesis is to introduce and promote astrotourism in a Danish coastal destination, which contributes to the region’s tourism development. Although this project is written from the perspective of tourism development with the main focus on domestic tourism in Denmark, the findings can be applied to attract international guests and introduce changes in the policies or regulations in order to save our night skies.

For many centuries, people have been taught about the dangers of darkness and how it can be fought with light. From a semantic perspective, darkness always has functioned as a synonym to the word “bad” and has negative connotation, while the word “light” has been perceived as a positive phenomenon. Although, lately, the understanding of the antonyms “darkness” and “light” has been changed due to the industrialisation and technological development. Following the timeline of technological progress, which started among other things with the invention of the light bulb back in the 19th century – the mass use of artificial lighting started spreading rapidly in the whole world (Department of Energy, 2013). But this achievement also had a negative effect, which only kept

increasing as the cities grew and nowadays it is still a huge issue not only for the environment, but also humans and animals.

The total amount of artificial light being emitted from all the streetlights, illuminated commercial signs, buildings etc. creates a phenomenon called *light pollution*. This phenomenon has a significant effect on the environment because of wrong, excessive and ineffective illumination of an area, where the light escapes in many different but the needed direction – creating a *skyglow* effect. The physical nature of light allows it to bounce off the ground and reach the sky, which causes an artificial brightness of the night sky above an inhabited area. Many studies have proved that light pollution and sky glow not only make the stars and the natural dark environment disappear, but it also disturbs wildlife, affects climate and human health (Dutfield, 2022).

Nowadays, in terms of tourism, Denmark aims to become the world's most sustainable destination (Green Tourism Organization, n.d.), while many destinations face multiple issues such as dependence on the summer season, unawareness of light pollution as a threat and partial lack of knowledge of environmental problems linked to the excessive use of light. But the unexplored opportunities could help Denmark to become a greater sustainable destination. As it can be seen in many reports, a typical tourist-year in Denmark appears to have a mountain-effect: at the beginning of the year, the number of visitors slowly begins to rise, peaking in the month of July and then it declines as the winter approaches (VisitDenmark, 2022, p. 13). The winter season across all the tourism industries and destinations in Denmark takes only 14% of the overall turnover (VisitDenmark, 2022, p. 13). At smaller destinations and local communities, it can lead to stagnation, because of lack of the jobs as in the case of any destination that is highly dependent on the number of guests during summer. So far, only Wonderful Copenhagen is able to maintain a balanced spread of the number of arriving visitors throughout a year that helps to keep stability in Copenhagen's economic sustainability based in case of tourism (Wonderful Copenhagen, 2020, p. 12). As a response to this issue and many destinations' dependence on the high tourist season, there have been created several guidelines, which highlight a need to create valuable experiences that would be able to attract people outside the high season in order to make it possible for local communities, stakeholders and businesses to use tourism as a source of income all year round. It has been especially highlighted by the Danish organisation Dansk Kyst- og Naturturisme (Danish Coastal and Nature Tourism) that the main focus point must be set on the nature- and outdoor experiences, as a response to the post-COVID trends, which have all the potential to expand the tourist season and contribute with "a billion Danish kroner" economic growth (Baumgarten, 2022).

One of the recent events that drew people's attention to the night sky as a unique phenomenon in Denmark was connected to a strong geomagnetic storm, which sparked extremely strong, and visible with the naked eye, display of the Northern Lights during the two nights on February 26th and 27th, 2023 (National Oceanic and Atmospheric Administration, 2023). Several local police departments were unable to precisely put a number of the nightly visitors at the popular coastal locations. Although, some people, who were among the astrotourists to watch the Aurora (from Latin, Aurora Borealis – Northern Lights), described the situation as “like a summer day” and “totally occupied parking space” (Ritzau, 2023) (Heebøll, 2023). For many people this was a unique experience, as the nationally alerted appearance of the Northern Lights greatly matched the weather conditions (Damsbo, 2023). But despite Denmark being located outside the general Auroral activity, the current Solar Cycle makes it possible to experience this phenomenon much more often than most of the people imagine (SpaceWeatherLive, 2023). And as news articles show, many are still unaware that such a unique phenomenon can be experienced in Denmark, while thinking of the Arctic region as the most suitable place for Aurora-hunting. Although if people are aware or are lucky enough, they can experience a certain phenomenon right in their home country (or even a hometown), without having to travel thousands of kilometres to another country. And then it can become a bucket list experience of the highest value (Kristensen, 2023).

But Northern Lights is just one of several astronomical phenomena that one can experience throughout a year. In general, astrotourism represents a variety of indoor and outdoor experiences, where as many as all the experiential realms (Entertainment, Education, Aesthetics, Escapism) (Pine & Gilmore, Welcome to the Experience Economy, 1998) can be included in the experience. Among such experiences are stargazing, visiting an observatory, eclipse-watching, astrophotography, mindfulness and many other. Already now, as many Danes have shared their impressions of the recent astronomical events, and with the national focus being recently drawn towards the night sky – there can simultaneously be seen issues, but also many opportunities that could help to expand tourist season in Denmark by introducing astrotourism to the general public and setting focus on nature experiences during the cold and dark winter months.

In general, darkness is an important element of our nature. Besides allowing humans and wildlife to regenerate during the sleep, it also enhances the number of visible stars and night-sky phenomena – that for some can be a source of inspiration and wonder. Especially the last-mentioned abilities of darkness have already been used in many destinations, where truly dark skies are being used as a natural resource that attracts many tourists who seek unique and memorable experiences. By promoting stargazing, communicating the impact of light pollution on our environment and

thinking of darkness as the human cultural and natural heritage, a destination can achieve people's intrigue, curiosity and even actions that can help spreading awareness about the importance of darkness.

But how do people in Denmark perceive the word “darkness”? Are they aware of light as a pollution that blocks out the night sky? And could darkness even become realised as a value that would contribute to the development of tourism in Denmark and to an expansion of the tourist season by applying the core ideas from the existing famous astro-destinations from around the world?

Although light pollution is a global environmental threat and there can be found many examples of unused opportunities by not adapting darkness as a natural resource, as being described by many astronomy-related associations, this research paper focuses on a specific region in Denmark. The North-western part of Denmark, including Thy and the islands of Thyholm and Mors, as well as other smaller islands in the Western part of the Limfjord, were selected as the core area for this project. According to the light pollution map, this is one of the darkest areas in the country, but it is a popular destination for people seeking nature experiences. National Park Thy, the North Sea and the Limfjord already play an important role in attracting nature-lovers and with the upcoming certification of the Bulbjerg-area as a Dark Sky Park (Skriver, 2022), as well as the expansion of the borders of the National Park Thy (Hawboernes Forening, 2020), this is the most relevant area to work with. At the same time, an old Danish expression “*The Dark Jutland*” and the presence of the longest uninhabited coastal area (RealDania, 2022) adds even more attention and relevance to this part of Denmark. This will allow to analyse the existing interpretations of this old saying to create a positive transformation, which could contribute to the tourism development in that chosen region.

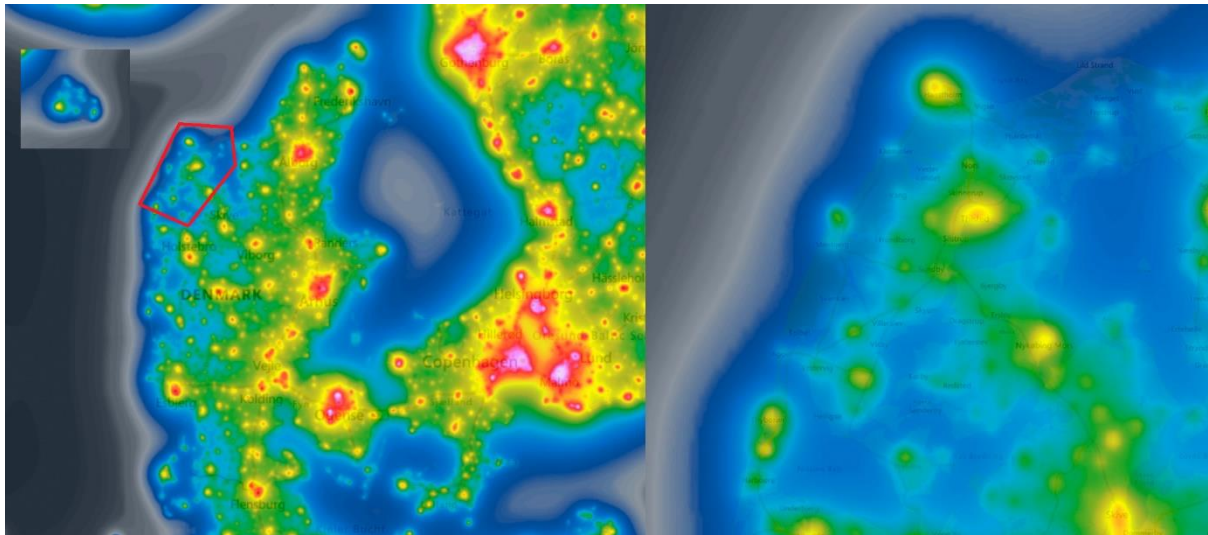


Figure 1. Definition of the research area in North-western Denmark (Falchi F. , et al., 2016)

In order to give an answer to the above-mentioned questions, and by focusing on the area of North-western Denmark as the case study, the following research question was developed:

“What are the interpretations of the term *darkness* and can they be used to create a value that would help tourism development in North-western Denmark using the strategies for place branding?”

Literature review

This chapter of the project provides the fundamental academic knowledge in order to answer the research question; moreover, it reviews the evolution of the perspectives on some of the topics that are relevant to this project and helps to find possible gaps in the literature.

Firstly, the literature review starts with the presentation of astrotourism as a special type of tourism, where the relevant definitions, classification, characteristics and benefits are mentioned. Since it can be seen as a relatively new term within tourism practices, especially in Denmark, it is important to define this type of tourism to set up the context.

Secondly, it is necessary to understand the various roles of any Destination Management/ Marketing Organisation (DMO) in presenting, developing and promoting of astrotourism to the general public. Since the aim of this thesis is to create awareness about light pollution and darkness by introducing different experiences, such as stargazing, to domestic tourists,

therefore it is crucial to investigate the possibilities and limits of the DMOs, if we want to achieve tourism development in the region of North-western Denmark. In this part, the concept of tourism development will be presented since it has a strong connection to the roles of the DMOs. Moreover, a review on the current trends will be presented together with the recent happenings that had affected the tourism sector.

Thirdly, the challenges and threats of light pollution will be presented, based on the old and new studies. Besides the light pollution's impact on humans, wildlife and environment, there are also presented different initiatives that are being used worldwide to save the quality of the night skies. Here, it is possible to draw a parallel between light pollution and sustainability to present how these two factors are tied together, but also to demonstrate the connected challenges in tourism.

Furthermore, the case of La Palma, Canary Island, is presented as an example of positioning a destination with the help of astrotourism – which is recognised as one of the world's best places for stargazing. The case of La Palma can be considered as the leading example of promoting a sustainable way of traveling, at the same time educating people about protection of darkness and the night sky.

Lastly, there is a brief presentation of astrotourism as a potential solution, which can help tourism development in the selected Danish region. This possible solution is based on the statistics that represent and highlight issues in the smaller destination nearly across the entire country.

What is astrotourism?

The term astrotourism consists of two words connected together – astronomical tourism. In the second half of the XX century, with the rise of amateur astronomy, people quickly realised that it is necessary to travel to a darker place in order to escape light-polluted city skies (Graham, 2020). At that time, astrotourism was only known as Dark Sky tourism, where people travelled to remote locations to experience darker skies unlike in the cities.

As our world became more interconnected following the rise of technology, people gained more knowledge about the existing nature phenomena. Although, before the invention of the internet, it was still difficult to get access to the information about something that people have never thought was existing (or simply were unaware of such a phenomenon). For example,

during blackouts in the 1990's, people in the constantly light-polluted Los Angeles were calling 911 because of witnessing a “large silvery cloud that trailed over the city”, which was the natural form of the Milky Way seen from Earth (Buck, 2017).

In general, astrotourism can be divided into two main categories: space tourism and terrestrial astrotourism. Since it requires a lot of money to travel to space, therefore this project will be strictly focused on the terrestrial astrotourism.

As of terrestrial tourism, it can be divided into multiple groups (Figure 2):

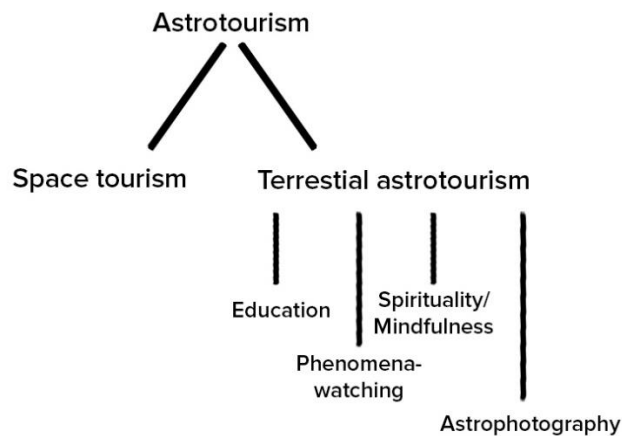


Figure 2. Categories of astrotourism

- Education – visiting observatories, planetariums, visitor centres, museums, attending workshops, conferences, going on field trips etc.
- Phenomena-watching – Northern Lights, planets, Milky Way, Lunar/Solar eclipse, stargazing, meteor showers, Zodiacal Lights etc.
- Spirituality/mindfulness – yoga under the night sky, quiet tourism etc.
- Astrophotography – photographing the night sky/phenomena.

Although terrestrial astrotourism is divided into four groups, they can overlap depending on the destination, travelling purpose and traveller's interests. For example, an astro-trip to La Palma in the Canary Islands can include elements, such as staying at a rural hotel in the mountains, visiting the observatory site with a guide and watching the Milky Way rise over the volcanic landscape, while taking pictures.

According to the La Palma-based Starlight Foundation, astrotourism is a crossover product of three travel interests – active tourism, ecotourism and scientific tourism, where environment, infrastructure and accessibility play some of the key roles (Varela, 2021, p. 4). The global statistics of the socio-economic impact of astrotourism from 2021 show an annual growth by

up to 300% both in terms of the number of visitors, but also economic contribution to the tourism sector (Varela, 2021, p. 14).

Astrotourism, at its initial stage, was known as Dark sky tourism and it was declared as niche tourism in the past, but recently it grew, being able to attract a wide group of tourists who seek for new adventures when the night falls. In the age of technology and social media, travel experiences under the natural dark sky offer an escape from the cyber sphere. Although, it is still not clear how exactly astrotourism gained such a rapidly increasing attention across the globe. Some sources state that in 2010 the eruption of the Icelandic volcano Eyjafjallajökull, has sparked a tourism boom in Iceland, which later became the primary contribution to the country's GDP by overtaking the fishing industry (Troxler, n.d.). Pictures of the Northern Lights and spectacular Icelandic landscapes quickly began to spread around the world and this unique presentation of the country, which most of the people never paid attention to, quickly positioned Iceland as a great place to visit no matter the season to experience extraordinary natural phenomena (Freytas-Tamura, 2016).

Other sources suggest that the Great American Eclipse in 2017 drew mass attention to the astronomy and our sky as a natural experience, which made more than 20 million adults to travel across the United States to watch the Solar Eclipse (Carey, 2019). Especially, as the technological progress allows carrying powerful cameras that can fit in a pocket, more people become encouraged in photographing the night sky, which only adds fuel to astrotourism as a growing trend (Carter, 2022). And as the interest in astrophotography is growing in the modern age of social media (also as a reaction to the COVID-lockdowns), it became nearly impossible to miss a picture or a video of the night sky when scrolling through the feed on different social media platforms (Buell, 2021). With the power of social media, it can only be expected to see astrotourism gaining popularity among the general public in our interconnected world.

Multiple roles of a DMO

DMOs have many meaningful roles in the working mechanism of any destination. When doing literature review of the different roles of a DMO, it is possible to observe a change and evolution in the tasks and responsibilities of this type of organisation throughout the years due to the globalisation, technological development and global mobility. Such changes call for reframing the responsibilities of these organisations, so they could facilitate the smart, sustainable development of

a destination (Presenza, Abbate, Sanchez, & Sheehan, 2016). DMOs have important roles in place branding and promoting the destination. Place branding encompasses multiple areas such as brand identity, marketing and advertising to international and national target groups. It reaches further than travelling and leisure activities, since it helps to develop the destination to its full including all the stakeholders. DMOs must develop the destination's identity, having in mind the DNA (history, culture, and climate) of the place and present it through their communication platforms. Through the marketing, DMOs are able to differentiate the destination and find the characteristics that are unique for the place. In order to reach the target audience, it is crucial to make research on their priorities and lifestyle to have an impact on their decisions. DMOs are also responsible for the future of the destinations, since they set goals and strategies for long run as well, following the vision of the destination together with the local stakeholders (Zetterberg, 2021).

Presenza et al. (Presenza, Sheehan, & Ritchie, 2005) identified the two-folded nature of a DMO, namely the external marketing function and the internal destination development function. Bieger et al. (2009) is following Presenza's definition of the roles and suggests that a DMO has, besides the two perspectives, another role, which is finding the sweet spot between the locals' needs, the destination identity and the external marketing. On the other hand, Pike & Page (2014) are against the view of a DMO being perceived as a management organisation, which results in putting more emphasis on the different marketing related roles of an organisation.

According to Jørgensen (2016), DMOs appear on different organisational levels in any country (national, regional, local), having multiple crucial roles to a destination:

- Marketing the actual destination, geographical area and also the group of stakeholders that are important actors in the tourism sector. Moreover, DMOs are responsible for the external communication, but also the internal structure and development of the destination.
- Management of the daily tasks, long-run plans and stakeholders. DMOs function as a connection between the government and the locals (citizens, stakeholders, business owners), but also between the tourist and the destination (Jørgensen, 2016).

Role
Community builder
Mediator
Stakeholder coordinator
Stakeholder representative
Public representative
Sustainability enforcer
Economic driver
Network creator/driver
Facility/Product developer
Destination manager/planner/developer
Gatekeeper

Although, many scholars are focusing only on these two roles of a

DMO, Jørgensen (2016) suggests that such organisations possess far more responsibilities within those two fields that are summarised in the figure (Figure 3), although it can be argued that all these roles can be sorted out as

Figure 3. The different roles of a DMO (Jørgensen, 2016, s. 625)

either marketing or management tasks.

Despite the roles of a DMO can be listed in a static table, these organisations are not static, since there are destination-specific issues or opportunities that call for more focus from a DMO. Because of the differences between the destinations, the analysis of a DMO as an isolated entity from the place where it is situated is not possible. Any DMO works as a network, together with the locals, stakeholders and also the governance, and must follow the given policy structures and discursive practices. This can lead to promotion of a specific initiative in some of the destinations or prioritisation of a particular local tourism policy action (Jørgensen, 2016).

In order to reach a holistic analysis of any DMO, there are criteria that must be researched – which are listed in the table below (Figure 4):

Dimensions	Aspects	Questions
Destination perception	Destination challenge(s)	What challenges does the destination face?
	Destination positioning	How is the destination product positioned in relation to its competitors?
	Success criteria for the destination	What is/are the goal(s) for the destination, what needs to happen for it to be considered a success?
Change strategy	Long- and short-term goals	What are the long- and short-term goals for DMO?
	Initiatives	What initiatives are taken to reach the goals?
	DMO resources	What qualitative and quantitative resources (money, information competencies, etc.) are available, how are these resources utilized and prioritized?
Governance	Destination internal governance	What characterizes the horizontal cooperation happening at the destination, how is the destination network structured, who are the central stakeholders, and how is the DMO positioned within the network?
	Destination external governance	How is the DMO inscribed in wider governance structures, including direct cooperation with other public bodies and indirect impact of their policies

Figure 4. DMO analysis framework (Jørgensen, 2016, p. 626)

As the table shows, there are three main dimensions that need to be further researched, led by the different aspects of each criterion in order to have a holistic view of a DMO and to be able to understand its working mechanism.

The most recent studies about the DMOs considered the interdependent functions (Pearce, 2016), the leadership as a concept in a destination management (Hristov D., 2020) and their role in community-building. As claimed by Pike & Page, despite having many meaningful roles in the mechanism of a destination “*DMOs are limited in what they can undertake and achieve in terms of management with many practical and logistical issues managed by local authorities*” (Pike & Page, 2014, p. 204).

In this paper, the framework developed by Jørgensen (2016) will be used and it will serve as a helping tool to firstly research the selected destination’s identity and the presented image of it addressed to tourists. Moreover, it will give an overview of the DMOs’ direction for the

future and an insight into the working mechanism of the governance internally, but also helps to uncover the external factors. This view will be crucial, since the initiation of the concept of astrotourism in the selected area will be in a strong correlation with the plans and priorities of the two DMOs, so it can be built in and become part of the brand of the presented area. In order to successfully integrate the new initiative in the marketing campaigns and to present it to the local stakeholders, the next steps in the literature review are researching the concept of tourism development and astrotourism.

Tourism development

According to the definition, tourism development refers to the different processes of planning, implementation, revision of strategies, infrastructure and projects with the aim of developing the tourism sector at a destination to increase the awareness of it and to attract more tourists to the place (Law Insider, n.d.).

Tourism is a global industry generating 10% of the world's jobs (UNWTO, 2019) and accounting for 10, 3% of the worldwide GDP in 2019 before the pandemic (Stare, dátum nélkül.). As the numbers show, tourism is an enormous industry and has both positive (increased standards of living, employment opportunities etc.) and negative (natural habitat loss, increased pollution etc.) impacts. In order to reduce the negative impacts of tourism, the World Tourism Organisation (UNWTO) was established as an agency of the United Nations, which is responsible for promoting sustainable, responsible and universally accessible tourism practices (UNWTO, n.d.). UNWTO sets multiple goals in the organisation's agenda, such as bringing tourism to the global agenda, promotion and support of the sustainable tourism development initiatives, fostering education, developing the destinations' competitiveness, contribution to the reduction of poverty through tourism development and building strong partnerships (UNWTO, n.d.). The UN 2030 Agenda for Sustainable Development sets multiple policies for the tourism industry and puts the sustainable development goals in focus for the policy makers, researchers and DMOs.

The aim of this paper is to help developing tourism in the North-western part of Denmark, so the domestic tourists would become more aware of the destination by introducing astrotourism to the broader audience of classical tourists. Astrotourism is considered an original and sustainable kind of special interests' tourism, since it uses the natural darkness and the night sky as the main resources and aims to promote astronomy along with scientific,

cultural and natural heritages connected to the sky. It can help remote areas to develop, since this type of tourism is usually practiced in the rural areas. Rural areas, far from the big cities, are the most suitable areas to practice astrotourism, because high levels of light pollution have a negative effect on the visibility of stars and quality of natural dark sky (NASA Science, 2020).

Recently, the Coronavirus pandemic had a negative impact on tourism from the economical perspective, but at the same time it enhanced some types of tourism practices such as outdoor, wellness and the so-called “staycation” tourism. Because of the lockdowns, most people could not enjoy the privilege of travelling outbound, so it was a given opportunity to explore the local area or plan a trip inbounds to explore their home country. Because of the fear of getting infected, people avoided crowded urban areas and, instead, they prioritised natural experiences to recharge and maintain their health and wellbeing (Tait, n.d.).

As described earlier, current trends and direction of the future tourism make astrotourism to be considered as a more popular kind of practice in the industry. By implementing the concept into development strategies in North-western Denmark, it allows the DMOs to choose a more sustainable way of evolution in the frames of tourism and to increase the competitiveness of the destination by offering new and differentiated experiences to the visitors.

Light pollution as a threat

One thing is inevitable to be able to gaze – and it is the lack of light pollution that had little attention until 2016, when the Science Advances released a report on the issue where it was stated that more than 80% of the world’s population live under light-polluted skies (Lerwill, 2022). Light pollution has been described as “inappropriate or excessive use of artificial light” that can have serious negative effects on the humans, wildlife and even on the climate. There are multiple components of the light pollution (Figure 5):

- Glare – refers to the brightness of the light that cause visual discomfort,
- Skyglow – an artificial brightness of the night sky above an inhabited area,
- Light trespass – unintended brightening of some areas,
- Clutter – excessive grouping of brightening sources (International Dark-Sky Association, n.d.).

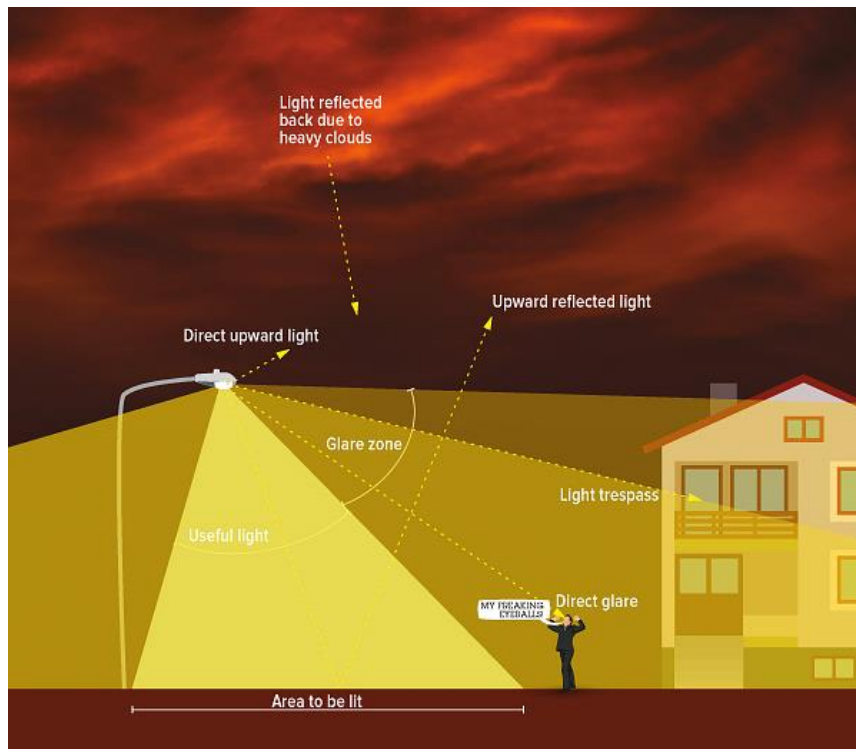


Figure 5. The components of the light pollution (International Dark-Sky Association, n.d.)

Light pollution is caused by industrialisation, and it is a result of an excessive outdoor lighting that most of the time is inefficient, not properly targeted and in many cases – unnecessary (Globe at Night, n.d.). Light pollution is a global issue, which was highlighted by the publication of the World Atlas of Night Sky Brightness in 2016, showing how and where the globe is lit up during the night (National Geographic Society, 2022). It is a computer-generated online atlas, based on multiple satellite photos, where people can see the glowing lights (the most light-polluted countries being Kuwait, Singapore and Qatar), but also the natural darkness in the remote areas around the globe (National Geographic Society, 2022).

In recent years, studies aiming to analyse the effects of the artificial light has discovered the harmful effects of the lightning on humans, animal and climate. The increased level of light at night reduces the level of melatonin hormone, which can cause fatigue, sleep deprivation, stress, headaches and other health-related problems in a human body. These studies even showed a relation between the reduced melatonin production and cancer (Al-Naggar & Anil, 2016). The American Medical Association, based on the researches, is supporting the efforts to control light pollution and to help conducting researches on the subject of exposure to light at night (National Geographic Society, 2022).

As mentioned earlier, the artificial light not only has negative effects on humans, but it is also harmful to the animal behaviours as well. Sea turtles and birds, during their migration period,

navigate with the help of moonlight and stars, but they get easily confused and lost because of artificial light, which can even cause their death (Australian Institute of Marine Science, n.d.). Moreover, according to a German study, this phenomenon is also affecting their circadian rhythm, such as birds that live in urban settings start waking up and singing hours earlier than the ones living in less light-polluted rural areas (The Max Planck Society, 2013).

In order to reduce, raise awareness and educate people on the light pollution, many relevant organisations were established by the end of the 20th century. Their goals are to reduce the effects of the problem by educating people on the disturbing nature of excess or unnecessary use of artificial lightning. Moreover, these organisations work towards informing about the proper use of lighting tools and their beneficial change in the long run – both economically and environmentally.

The oldest and the most recognised organisation in this field worldwide is the International Dark-Sky Association (IDA), which has a mission to “preserve and protect the night time environment” (Bobkowska et al., 2020) by raising awareness of the heritage of the dark sky and by sharing knowledge about the quality lightning. Currently, IDA is present worldwide on 5 continents with 50 chapters, which helps to spread the awareness about this global problem. Within the organisation there exists also a technical committee that gives advice to the board of directors and creates relevant policies to reduce light pollution. In 2020, IDA had an agreement with the recognised authority on the illumination in the US, Illuminating Engineering Society (IES), and released The Five Principles for Responsible Outdoor Lighting, which aims to protect the nocturnal landscape by recommending steps to follow:

1. Use light purposefully only when needed,
2. Use of shielding and direct light only when it is needed,
3. Brightness’ level should be as low as possible,
4. Control the light with, for example: timers, sensors, motion detectors etc.,
5. Avoid using the shorter wavelength (blue-violet) lightning in favour of the warm, colour lightning (Bobkowska et al., 2020).

Moreover, IDA has created a conservation programme aiming to preserve the natural dark-sky destinations. It was launched in 2001 to help parks, communities and protected areas to preserve and protect the valuable places, while offering education about responsible lightning and by sharing knowledge about the subject with the public. Currently, IDA offers a certificate among five categories (IDA, n.d.):

- International Dark Sky Sanctuaries – placed in the most remote areas, where there are few or no threats to the quality of the dark sky, therefore they offer exceptional quality of starry nights. Because of their remoteness, they are not capable to outreach the public, but this category increases the awareness to these fragile environments and promotes the long-term protection.
- International Dark Sky Parks – are either publicly or privately owned places with exceptional quality of nocturnal sky due to the implementation of good outdoor lightning, where the visitors can enjoy astronomy-related activities. The islands of Møn and Nyord in Denmark are part of the conservation programme as an International Dark Sky Park and Community since 2017, which is the first case in Scandinavia. It is a residential initiative that aims to promote the unique natural dark sky of the place in order to develop the tourism and economic potential.
- International Dark Sky Reserves – consist of a core area with minimum criteria of sky quality and natural darkness with a peripheral area that supports the preservation of the core.
- Urban Night Sky Places – places near or surrounded by the urban sphere like a municipal park, open space or an observing site. They do not offer a good sky quality or darkness, but they make efforts to educate the public on proper outdoor lightning and minimizing the harm that can cause to the natural night-time environment.
- International Dark Sky Communities – cities, communities and towns that had shown an exceptional dedication to the preservation of the night sky, but they also educate the public and set good examples to other communities (IDA, n.d.).

Additionally, the association had previously (2020) stopped awarding with nominations for the category called Dark Sky Friendly Developments of Distinction, which was related to suburban neighbourhoods with a master plan focusing on sensitive outdoor lightning to preserve the natural environment and to avoid using unnecessary light at night (IDA, n.d.).

By January 2023, there are 201 certified Dark Sky Places including 115 Parks, 38 Communities, 20 Reserves, 16 Sanctuaries, 6 Urban Night Sky Places, and 6 Dark Sky Friendly Developments of Distinction. After receiving the certificate, there happen periodical revisions in order to maintain the commitment to the dark-sky preservation. From the dark sky places' perspective, IDA helps to promote destinations on social media, media relations

and with the help of a certificate, a destination earns more visibility by the international public, which helps to increase both tourism and economic activity (IDA, n.d.).

Another worldwide initiative that aims to raise awareness of the loss of the natural night is called Earth Hour. This initiative dates back to 2007 that originated in Sydney, Australia, where communities and businesses turn the unnecessary electric lights off for an hour between 20:30 and 21:30 on the last Saturday of March. Even though it is only a symbolic action, it caught the attention of more than 7000 cities in 187 different countries around the world. In figure 6 (Figure 6) the city of Hong Kong is represented during the Earth Hour and the difference that the unnecessary lightning makes on the landscape (Bobkowska et al., 2020).



Figure 6. Hong Kong's skyline during the Earth Hour in 2013 (Bobkowska et al., 2020)

There are numerous standardised organisations across the European Union as well, which set limits to the level of illumination and laws on this issue. The European Committee for Standardization is responsible for creation of the European Lighting Standard as being a technical document serving as a guideline for using artificial lightning properly (Bobkowska et al., 2020).

A new report on light pollution

In January 2023 a new report on light pollution around the globe has been released. According to the analysis of the data, which was collected with the help of citizen science throughout a 10-year period from 2011 to 2022, the overall level of light pollution has skyrocketed (Falchi & Bará, 2023). Following the analysed data, in Europe brightness of the sky glowing with an artificial twilight increases by 6,5% each year (Helmholtz Association of German Research Centres, 2023). The increase of artificial light at night not only limits the number of stars visible to the human eye, but also influences the behaviours and physiological processes of living creatures, which lives are determined by daily and seasonal cycles (Helmholtz Association of German Research Centres, 2023). In other words, light pollution affects directly human cultural and natural heritage, because of the change in appearance of the night sky.

Even though light pollution can be easily visually observed, in reality it appears as a “phenomenon” that is difficult to measure. Scientists state that technically it is possible to measure brightness of the skyglow directly with the help of satellite observations, but the spacecrafts’ tools have limited resolution and light sensitivity (Kyba, Altıntaş, Walker, & Newhouse, 2023). Shorter wavelengths scatter more effectively in the atmosphere, meaning that upwards emitted light can bounce back to Earth as skyglow; the mass use of white LEDs becomes nearly invisible to the satellite observations because of their emission peak at shorter wavelengths; and human visual sensitivity shifts toward shorter wavelengths at night (Kyba et al., 2023). These three factors can mean that a measure of the ground radiance might not correspond to the change of skyglow, as seen from a satellite’s point of view, but it might also mean that different wavelengths of the skyglow make it unclear whether the number of stars visible to humans would increase or decrease (Kyba et al., 2023).

The conclusion of the report on light pollution, published in January 2023, states that citizen science provides an important data, which cannot be collected via satellites and the analysed data showed a rapid deterioration of visible stars at night that can be connected to the mass use of LED light sources. In addition, none of the existing lighting policies are preventing the increase in brightness of skyglow, at least on continental or global scales (Kyba et al., 2023). Though, when it comes to mapping of light pollution on a global scale, World Atlas from 2016 is the most widespread source of visual presentation of the skyglow based on the analysis of satellite measures (Falchi F. , Cinzano, Duriscoe, & Kyba, 2016). Since the newly

published report was only based on visual measures, we are still yet to see an updated global map of the artificial sky brightness.

Case of sky protection and its meaning for tourism on the Canary Islands

The Canary Islands are a Spanish autonomous region, located in the Atlantic Ocean, which economy is heavily dependent on the tourism sector (Caixa Bank Research, 2021). The Canary Islands promote their destination as “one of the best places in the world to enjoy the Universe” (Spain.info, n.d.), where already back in 2012 the statistics showed astrotourism becoming a booming tourism industry, drawing about 200 000 visitors annually (Burleigh, 2016). Some of the explanations behind the rise of astrotourism on the Canary Islands are:

1. Archipelago’s strategic position, where clouds rarely form
2. Archipelago’s geography and geology
3. Location of several astrophysical observatories
4. Protection of the night sky by Sky Law of 1988 (MarcaCanaria, n.d.).

Despite many attractive natural factors, protection of the night sky on the Canary Islands has generated lots of attention from around the world. The so-called Sky Law, proposed by the parliament of the Canary Islands and advised by the Institute of Astrophysics of the Canaries (IAC), was approved by the government in 1992 with the main goal to protect the astronomical quality of observatories in the Canaries from different types of pollution (Instituto de Astrofísica de Canarias, n.d.). Here, light pollution is being mentioned as the first point in the Sky Law, because it is one of the most damaging effects for astronomical observations. The Sky Protection Law has a list of regulations for the use of outdoor lighting on the islands of Tenerife and La Palma which contribute to the reduction of light pollution and energy saving by the use of environmentally oriented lighting projects (Halper, 2018).

The island of La Palma became the first Starlight Reserve as a result of the first Starlight Conference in 2007, where the “Declaration in Defence of the Night Sky and the Right to Starlight” was written. At the same convention with the help of UNESCO, a Starlight Foundation and a Starlight Initiative were created, which certify “Starlight Reserves” around the world (Burleigh, 2016). Among the objectives of the Starlight Foundation are cultural dissemination of astronomy and promotion of astrotourism to enable people to appreciate the starry night sky in dark sky place (Starlight Foundation, n.d.).

In other words, Canary Islands have achieved a strong positioning within astrotourism with the help of their geostrategic position, climate, natural landscapes and legislation. Nowadays, astrotourism is one of the main attractions of the Canary Islands, especially on the islands of Tenerife and La Palma, where people can get many relevant experiences such as stargazing from the astronomical viewpoints, visiting an astronomical visitor centre, going on a guided tour under the stars, staying at a Starlight establishment or having an astronomical gastronomy experience (Spain.info, n.d.). According to the presentation on “Sustainable development and Astro-tourism” from Starlight Foundation and IAC from October 3rd, 2021, alone on La Palma astrotourism generates approximately 29,5 million euros as a contribution to the income from tourism annually. As of 2021, La Palma has more than 120 certified guides, dozens of astrotourism-related companies, wineries, restaurants, shops, accommodations, trails, astronomical viewpoints and visitor centres themed around astrotourism (Verela, 2021).

Light pollution and sustainability

Despite light pollution being a global issue, the EU is missing a common legal framework regulating it, and the artificial light at night (ALAN) has not been claimed as a contaminant, which leads to not prioritising the issue despite its negative effects on the living organisms. Even though there is no legal framework, there are some EU directives aiming to target lightning requirements. The European Ecodesign Directive and the Energy Labelling and Repealing Directive are in charge of ensuring an energy-effective lightning, but there is no section on the harmful effects of light pollution.

Another perspective on the adverse effects of the issue is brought up in the Biodiversity Strategy, Birds and Habitats Directives and Pollinators Initiative, which claims that light pollution is a disturbing factor in the area they are being advocate for. The Environmental Impact Assessment (EIA) and the Strategic Environmental Assessment (SEA), which aims to protect human health and natural environment, also pointed out the negative impact of the issue. There are some recommendations for the reduction of light pollution, such as the EU Green Public Procurement (GPP), which was updated in 2019 with the “as low as reasonably achievable” concept to solve the problem, but it is still just an advisory document. Recently, the issue was handled as a priority objective by the European Green Deal and the Zero Pollution Action Plan of the 8th Environment Action plan, where the focus was on the

protection of human well-being, animals and ecosystems. In 2021, the European Commission listed light pollution as a competent pollutant in the Sustainable Finance Regulation (Wildmer et al., 2022).

From the standpoint of UN's Sustainable Development Goals (SDGs), light pollution and protection of the night sky are not being listed among the 17 existing SDGs (United Nations, n.d.). Although, it can be argued that SDG #11 (Sustainable Cities and Communities) and SDG #13 (Climate Action) could be interpreted as goals that might include fighting light pollution – but the main focus of those points is reduction of carbon emissions (United Nations, n.d.).

In 2021 Starlight Foundation and the Federation of Business and Professional Women of Spain have announced an initiative to create an 18th SDG – a Sustainable Development Goals for the Sky Quality and Access to Starlight (Starlight Foundation, 2021). As described on their website, the perception of the night sky as a resource must be safeguarded not only for science, but also as a cultural, environmental, biodiversity, health and quality-of-life heritage and as an engine of sustainable economy through star tourism (Foundation Starlight & BPW Spain, n.d.). The initiative of adding the 18th SDG can be found as an open petition that anyone can sign, which will be revised by the United Nations' Department of Economic and Social Affairs.

Astrotourism as an opportunity for season expansion in Denmark

As it was mentioned in the introduction, most of the destinations in Denmark experience a significant change in the number of visitors throughout a year. The so-called high season is considered to be the three summer months, peaking in July for Danes, while international tourists chose to travel to Denmark during August (VisitDenmark, 2022, p. 13). This uneven spread of visitor number and overload lead to several issues, such as economic instability, dependence on the high season and crowded spaces. Although, recent trends such as post-COVID way of travelling in form of escaping the crowds, nature- and ecotourism and sustainability have affected many destinations, it can still be seen that all-year tourism haven't been realised yet, except Copenhagen (Wonderful Copenhagen, 2020, p. 12). As of the year 2023, the still ongoing war in Ukraine and high inflation already have affected prognoses for the economic development in the tourism sector (Dansk Industri, 2022). It might be possible to see more people seeking for more outdoor experiences or even a smarter

distribution of tourists' spendings (e.g., less restaurant/café visits, preferring a cheaper accommodation etc.). Although, a Danish report showed that Danes are not just planning their vacations in the same way as before the pandemic, but also are buying more expensive tours (Neupert, 2023).

Astrotourism is considered to be a great example of not just a general sustainable development, but also an example of a sustainable tourism development (Escario-Sierra et.al., 2022). It combines several forms of sustainable and responsible form of tourism, where main travelling goals are defined within night sky observations, education and leisure activities related to astronomy (Verela, 2021). Some of the core values of astrotourism can even be seen as the first mainstream connection between science and tourism, as they focus on culture and heritage, education, astronomical observations, biodiversity and health. Another important value of astrotourism is its ability to create deseasonalisation – meaning, expanding the season by promoting night skies and other activities as an all-year-round destination. There are also economic benefits, because people might be staying up late to watch the stars, it can be helpful to reconsider accommodations in terms of their opening period and location. Together with post-pandemic trends, the search for not overcrowded, safe, open and quiet places, inclusivity and a combination of attractiveness, personalised and gazing elements in the experiences create opportunities for tourism development in the North-western part of Denmark, where nature is already being presented as a valuable experience for visitors.

In conclusion, this literature review contains meaningful reviews of the existing scholarly works and also reflections to the project, which offer a strong positioning of this thesis in the context of existing literature. Moreover, it helps to emerge tourism perspective with scientific reasoning for reduction of light pollution. This paper aims to show a possibility to change a socially constructed, negative view on darkness as a phenomenon and to use it as a unique facility within a destination.

Theoretical approach

Tourism is a multidimensional industry, which in reality consists of many different industries. Because of tourism's complexity, it might be extremely difficult to work with it as a single whole unit. Suppliers, stakeholders, product, experience- and service providers can represent multiple industries, meanwhile tourists get an overall tourism experience which they will reflect on. Many researchers present tourism as a "multidimensional phenomenon", because it can be viewed as a process that evolutionises society in relation to tourism (Foris, 2014, p. 71). At the same time, it requires several scientific approaches to interpret tourism, such as economic, administrative, geographical, political, social, cultural etc.

There can already be seen a need for applying several theories, because of the complexity of the tourism industry and the goal of this research paper being contribution to tourism development in North-western Jutland, which includes several aspects to be researched. Reflecting back to the problem formulation and the research question "*What are the interpretations of the term darkness and can they be used to create a value that would help tourism development in North-western Denmark using the strategies for place branding?*", this paper focuses on tourism development through the implementation of astrotourism in this particular part of Denmark. Although, astrotourism can be interpreted as an underdeveloped (or even unknown) sector in Denmark, there can still be applied relevant general theories for business development, experience economy, marketing and branding. There are several ways how a business industry (like tourism) can be developed, but in the case of this project the following timeline has been chosen:

1. Creating an economic value of the night sky,
2. Branding the place,
3. Marketing the place.

As it was mentioned earlier, DMOs have several roles, among which are creating and implementing marketing campaigns, providing tourists with information and managing stakeholders. The aim of all these elements combined is to attract guests to the destination by presenting its unique characteristics and its offers of experiences and products. Those three theoretical approaches will help to define the needed strategies and actions that Destination Limfjorden and Destination Nordvestkysten (representing the selected geographical area) have to apply in order to solve current issues in the region related to tourism. It is among the

responsibilities of the DMOs to create new strategies, which will attract more attention to a specific area – at the same time, closely cooperating with the local people and businesses.

Experience economy in tourism

Since the aim of this project is to introduce astrotourism in the North-western Jutland to a broader public, which could contribute to the tourism development in the region, there is a need to offer different experiences and to become appealing among many other rivalry destinations. This is crucial, so tourists can get memorable and valuable input during their trips to the region. Tourists in general are not thinking about the borders of a destination as a unit, because they plan their trip based on the experiences they are being offered. Therefore, collaborations between the destinations can result in activities that catch tourists' attention. For this reason, a theory behind the experience economy will be presented in order to find out how it can help the chosen destination to achieve success in tourism development.

Back in 1998, Pine and Gilmore introduced the concept of experience economy to the broader public. They presented it as the fourth level in the progression of economic value, where one can see that a development in the offering of a business starts from the undifferentiated commodities and goods until they become premium and personalised experiences, as the figure below presents (Figure 7) (Pine & Gilmore, 1998).

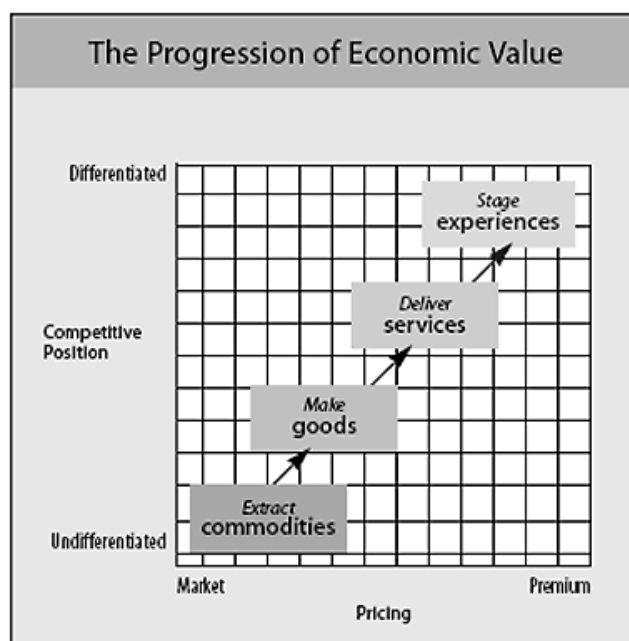


Figure 7. The progress of the economic value (Pine & Gilmore, 1998)

As Pine & Gilmore claim “*an experience occurs when a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event*” (Pine & Gilmore, 1998). In the case of the chosen region as a destination, the local DMOs can have a leading role in designing and building up experiences together with the locals, since the stage is already given, and the region is lacking big cities, which is a sign of good opportunities to become an astro destination. By thinking about darkness and given characteristics of the location as commodities, it is possible to go through the process of economic value creation by strategically planning to offer differentiated, premium experiences for tourists. The step from services to experiences covers the interaction between the individual’s state of mind and the experience self. Since when purchasing a service, a customer gets a set of standard activities, but experiences offer a personal connection between the destination and the tourist. The experiential value creates a more competitive place in the service industries by differentiating experiences from other similar offers (Pine II & Gilmore, 2019, p. 22).

As Andersson (2007) describes, experiences are elements that connect production and consumption. There are two concepts that must be presented in order to discuss their viewpoint on the experience economy in tourism:

1. a consumption project – referring to the activities that are carried out with the aim of generating experience, and
2. a consumption set – defined by the resources that are necessary to accomplish a consumption project, namely four generic elements: time, skills, goods and services (Andersson, 2007).

According to Andersson, a tourist becomes an active participant of the processes in a consumption project by getting necessary resources and combining them with the time and space to create a positive experience. While planning a holiday, a potential tourist judges the potential experiences by looking at the pricing of goods and services. For many, the process of planning together with the imagination of the holiday beforehand is an innovative activity, which generates a demand and desire for travelling. In psychophysiology, the term *arousal* is understood as the state of excitement and awakening of a human being, which people seek to reach at the optimal level. This is controlled by two nerve systems: the BAS (Behavioural Activation System), reacting to potential rewards to increase the arousal level and the BIS (Behavioural Inhibition System), reacting to the fear or punishment to decrease the level of arousal (Figure 8) (Andersson, 2007).

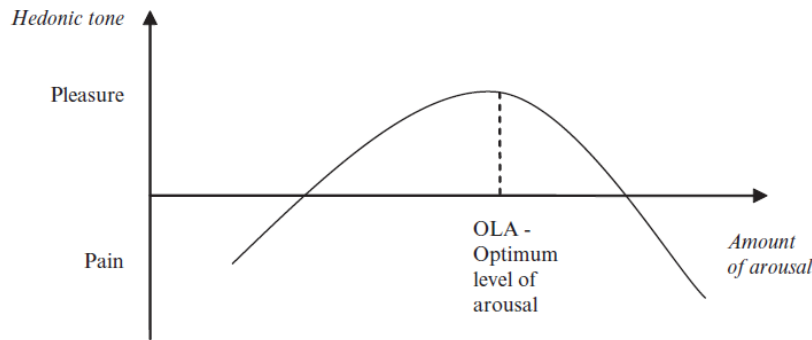


Figure 8. A model of satiable needs and negative marginal utility (Andersson, 2007)

In conclusion, both BIS and BAS are equally causing arousal. The rewards triggering the BAS are related to the needed fulfilment, which is a vast topic in psychology. Following Maslow's hierarchy of needs, individuals are facing multiple needs categorised on three levels:

- Basic needs for survivals
- Social needs – belonging to a group of people; love and care from family and friends
- The intellectual need for novelty, excitement and challenges. This category of needs can also be fulfilled by fiction or imagination by reading a book, watching theatre play or listening to music (Andersson, 2007).

The individual needs for basic, social and intellectual needs depend on the level of each of these three levels. An experience can have a positive effect on all three categories of needs: for example, a great dinner with friends that satisfies basic needs, but it also has a social value in it, and if the dinner is composed of new tastes – then it will have novelty in it as well. Therefore, the value of an experience depends on the needs of a tourist and stimuli that a consumption project generates for the individual. But on the other hand, in order to carry out a consumption project, it requires some resources that are being used by a tourist throughout a consumption project. Those are categorised in four different categories:

- Time – as a limited human resource. Productive time is defined by the actions when a tourist generates monetary resources to be able to purchase goods and services that will be consumed during a consumption project. A consumption time refers to the time span of consuming an experience.
- Skills – they play an important role as production resources and consumption purposes as well. The value of arousal is affected by the number of novelties - too much novelty can

transform a person into one who is unintelligible and bewildering, whereas too little novelty can turn a person into being boring, dull and without challenges in relation of skills.

- Goods – during a consumption, one can use goods purchased long ago, but also purchase new goods that will be used specifically for the experience. A particular brand of goods or a specific destination can make a (potential) tourist with strong desire to belong to a special social status to attach a much higher value to the goods than other products, which are equally functional as consumption products. This leads to the conclusion that branding may influence the social value of an experience.
- Services – are mostly determined by a specific experience and are consumed during the period of that specific experience. The more assets a tourist owns, the more likely they are to be able to produce a service by themselves and become less dependent on services provided by others (Andersson, 2007).

Consumers are the last chain of a consumption process, and they are in charge of a consumption project using the consumption set, consisting of the aforementioned elements. Andersson accentuates that purchasing is not equal consumption, only when it is used in different projects, while creating values. Values of different experiences depend on the needs of an individual. The arousal is included in the higher-level needs, which adds a value to experiences. It has been highlighted that in order to create experiences, a tourist also needs to bring some resources in the consumption project and consumption processes, which can be affected by the tourist's background and their previous experiences (Andersson, 2007).

Based on Maslow's hierarchy of needs, Philip L. Pearce et al. (1988) have developed the theory of travel career ladder (TCL), which describes different tourist motivations. Based on empirically tested data the theory was updated in 2005 and it emphasises that tourists develop patterns and multiple motivations to travel rather having one single motivation. Pearce also insists that travel motivations can come from the outside in case of a group- or a self-directed experience during solo trips (Williams & McNail, 2011). The TCL model has five levels (Figure 9):



Figure 9. Pierce's TCL model

We can observe a similarity with Maslow's model of Hierarchy of Needs since it follows the idea of physiological model of maturation once the individual reaches the pyramid's next level. Moreover, it reflects on the finding that it is impossible to progress if there are missing lower order motives or needs. Pearce claims that as the tourist becomes more experienced, their motivations for travel become higher order needs – not just fulfilling body's signals to relax or to compensate for safety issues (Ryan, 1998).

In the case of TCL model, people can have different starting points and experiences, which require a more dynamic and developmental way of looking at different motivations. Moreover, some individuals can choose to climb solo part of the ladder, while others – focus on group experiences, but there also is a third group of individuals that mixes these two sides of the theory.

To sum up, this theory illustrates that people's motivations to travel may change over time and as they acquire more experience, it can have an impact on their traveling preferences.

Therefore, a travel motivation is not static over lifetime, but it rather is dynamic, and it can be influenced by many factors.

Co-creation of the experiences

According to Decker & Binkhorst (2009), there is a growing need of “*the construction of narrative of the self*” in the consumer society – instead of consuming staged artificial experiences, people are willing to influence the experience and become co-creators (Binkhorst & Dekker, 2009). They seek for authentic, context-related experiences, where there is a balance over the control between the stager and themselves, so consumers are able to creatively shape the experience.

This new approach results in a customer becoming the designer of an experience, and therefore, companies must get into the dialogue with consumers to generate a unique value. This new view on co-creation has turned the product-centred development into the individual, customer-centred view, where lifestyle of a potential customer is researched, rather than only focusing on the product-use and buying behaviour (Binkhorst & Dekker, 2009).

The co-creation of an experience was defined as “*result from the interaction of an individual at a specific place and time and within the context of a specific act*” (Binkhorst & Dekker, 2009). There is a tendency of growing consumption of experiences, rather than goods and services, which means that quality of life is judged in terms of the access to those experiences. We can see a growing number of co-creation practices on different websites and in tourism, such as coach-sharing websites, house-swapping and user-generated pod tours, where interaction is in the centre of an activity. But not only among tourists there is a presence of generated co-created activities, as we can observe the same trend between suppliers, and suppliers and consumers as well. Another type of co-creation can be between locals and tourist – for example, in form of workshops teaching about the local gastronomy, art, dancing or language (Binkhorst & Dekker, 2009).

For this new perspective on tourism, Binkhorst & Dekker suggests a more holistic view on all the stakeholders in tourism industry, where everyone is connected in the experience environment. They emphasise that a latent need to travel rises at work-, school-, and home-related environments, when the individual decides to go on vacation. The figures below (Figures 10-12) illustrate that people have a continuously changing experience network depending on the phase of their decision-making processes (Binkhorst & Dekker, 2009).

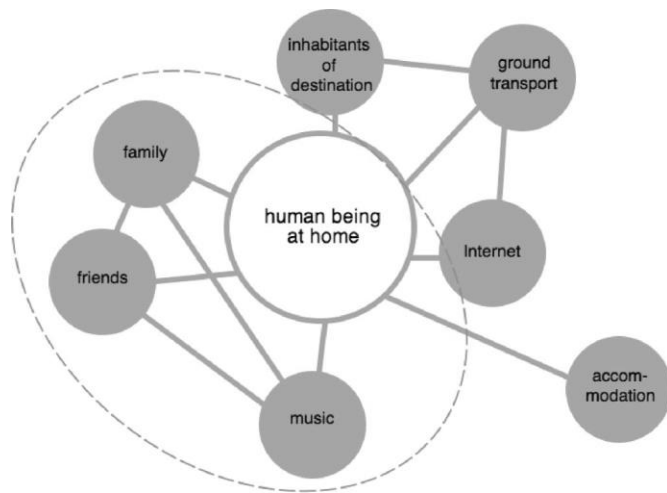


Figure 10. Tourism experience network in the home-experience environment (Binkhorst & Dekker, 2009). Note: at that time, internet didn't have as much influence as today.

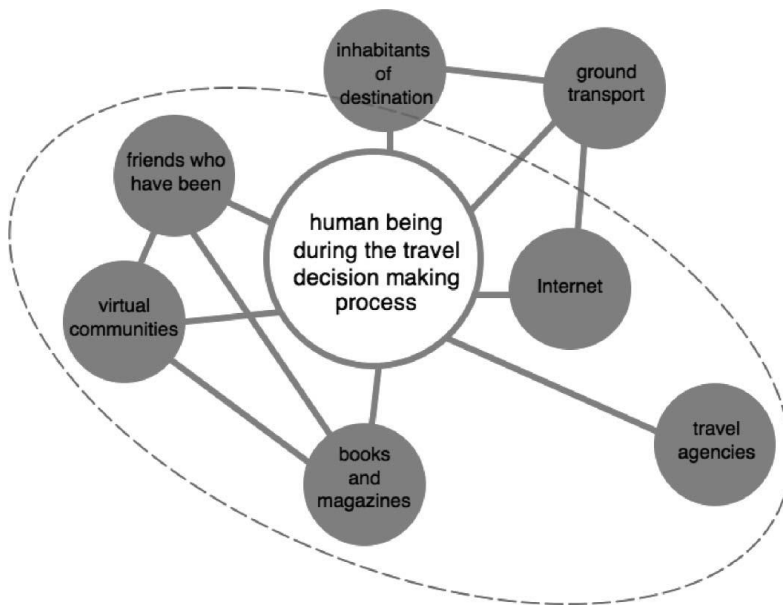


Figure 11. Tourism experience network during the travel decision-making process (Binkhorst & Dekker, 2009)

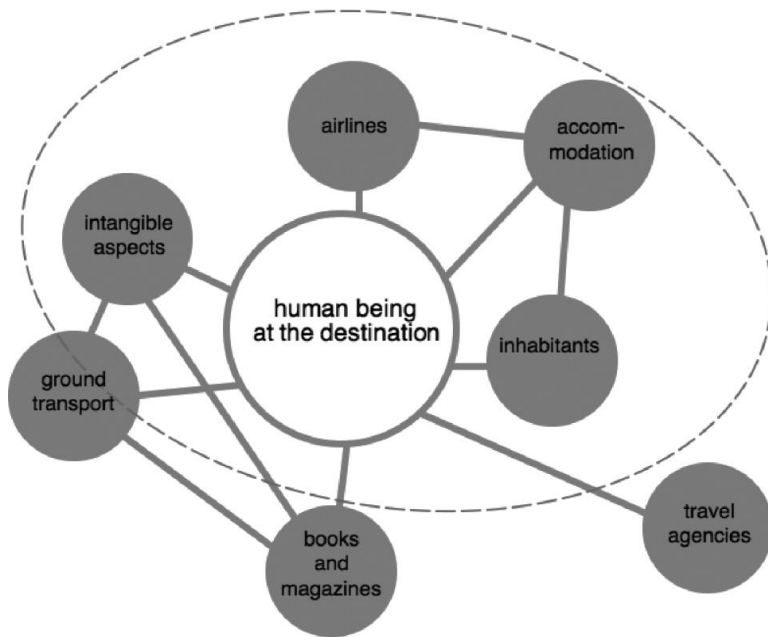


Figure 12. Tourism experience network away from the home environment (Binkhorst & Dekker, 2009)

Because of this broad network of all the stakeholders, a positive interaction between stakeholders and consumers is the key to a meaningful co-creation. With the help of technological improvements, it is possible to have helpful conversations with the customers, which provides a basis to innovation in tourism by co-creating experiences.

As the conclusion of this part, tourism sector faces many meaningful changes these days, which help to view a tourist as a human being, operating in various tourism environments. Those environments are all connected to each other and have an influence on the decision-making processes even before having an idea of planning a trip. This view also puts the “host” communities into a more important role, since they have direct contact with the tourist, and they are part of any experience by co-creating it together with the tourist. Moreover, designing an open environment to allow the co-creation of an experience will result in more unique and authentic experiences, which help differentiating the destination from other competitors that have similar profiles (Binkhorst & Dekker, 2009).

Place branding

One of the most common justifications for the importance of place branding is the nature of increasing competitive forces between places (Ashworth, Kavaratzis, & Warnaby, 2014, p. 4). It is the arena of competition, which makes the place branding both reasonable and popular as

a practice for places to compete for different types of resources – such as human, cultural, financial etc. With the help of place branding, places are able to achieve (or secure) a desired position within the flow, but it also provides a strategic guidance for development of a place (Ashworth, Kavaratzis, & Warnaby, 2014, p. 4). Although place branding can be referred to city branding and development of urban spaces (Kavaratzis & Hatch, 2013), it can still be applied to this thesis as one of the theories. This research focuses on the North-western Jutland in Denmark as a region and as a united Dark-Sky destination, despite being divided between three municipalities and two DMOs. Therefore, a theory of place branding is relevant to use in this case, as the goal of this project is to achieve a development in tourism by creating a strong relation between the place and the consumer in this particular region of Denmark. From one perspective, branding can be seen as a general strategic guideline for marketing, but from another perspective, as mentioned earlier – it provides places with a strategic masterplan for development. Although in general, place branding shapes future development, which is based on the expectations from the consumers (visitors, locals, stakeholders, investors etc.): *“Place brands are thought to shape the expectations people have of a place and thus their experience, which, in turn, is thought to lead to increased satisfaction that people derive out of such experience.”* (Ashworth, Kavaratzis, & Warnaby, 2014). In other words, the place branding theory is all about creating a positive image of a physical place, so the consumer feels the need to visit it.

According to Ashworth et.al. (2014, s. 5), the brand of a place can be constructed with the help of four elements:

1. Promotional tactics and identity claims – where brand identity is built through communication by local stakeholders
2. Associations with place-making elements – where much complexed processes of branding are involved, which create a link between the place and the brand
3. Narratives or “place stories” – where all possible narrations of the place’s story take part in place branding. It is an uncontrolled environment, where Word-of-Mouth (WOM) has a strong power
4. Interactive formations – where place branding is built through collective construction and social interactions (Ashworth, Kavaratzis, & Warnaby, 2014).

Brand identity is one of the most fundamental aspects in place branding, especially in tourism. Following the first articles about place branding from the 1950’s, already back then it was stated by several academics that it is important to differentiate the brand from other

businesses/competitors by focusing on feelings and emotions of the brand (Hankinson, 2014, s. 20-21). Although, creating a unique identity can be interfered by the political difficulties, requiring an in-depth analysis of the destination's political decision-making processes, since there might be both internal and external conflicts that affect a development of a common brand identity.

The paradox of the place branding theory being used for this thesis is that the theory does not differentiate consumers or visitors into different target groups, because it focuses on a geographical place. Visitors might have different interests and because of their diversity, a place branding strategy must include many different aspects that will target several interest groups at once. Although, some people might view working with astrotourism as a niche sector in tourism, since it requires attending activities that are related to astronomy. In the light of recent events, such as The Great American Eclipse of 2017, solar activity, the presence of naked-eye Aurora across whole Denmark, and influence of visual communication on social media, it gets more and more challenging to call astrotourism as a niche sector. But what is possible in this paper – is to focus on tourism development in North-western Jutland with the help of astrotourism as a brand within tourism itself. Because the aim of this thesis is to create differentiated values by transforming the understanding of darkness in order to help region's tourism development, therefore place branding theory will be limited by focusing on astrotourism.

Following the research question, if potential visitors view darkness and dark sky as valuable resources – such could be transformed into brand values in the process of North-western Jutland's place branding processes. A brand value is a brand's ideology and principles that shape consumers' response towards a brand, which can be both measured and described (Zenker & Braun, 2014, s. 2014). Like the strategies of a place branding, brand values help to differentiate a destination from its competitors by connecting the brand of a place with its visitors in many different ways. Typically, such connection is focused on emotions as the highest value in experience economy, although branding the destination as a great dark-sky area must also focus on the fundamental values of educating people and allowing them to explore the area at night.

It is possible to assume that among brand values in the case of working with astrotourism, there would be focus on the quality of the dark-sky environment and destination's actions to prevent the increasing level of light pollution as part of a sustainable development.

As it is presented in this chapter, place branding is a complex process that helps destinations to develop strategies to create an attractive image of a certain place to attract more visitors by passing other competitors in the tourism industry. Since the initial task of the research question is defined as finding the interpretations and understandings of the term “darkness”, this project deals with people’s personal feelings and stories that work as a fundament for the way how tourism development using astrotourism will be approached. By identifying those feelings and interpretations, it is possible to focus on the brand identity and messaging of North-western Jutland as a dark sky destination, which helps to develop a differentiated positioning strategy. Although, it is also important to define existing and to form new unique selling propositions (USP) that will secure visibility to the outside (Warnaby, 2014, s. 176). By identifying USPs that are differentiated from other Danish regions, it will help creating a positioning strategy for North-western Jutland as a united dark-sky destination.

In conclusion, theory of place branding in the case of this thesis will be used for the analysis of people’s understandings of darkness as part of natural environment, where positive interpretations would be used for a strategic development focusing on a new brand identity, brand messaging and brand image. Simultaneously, identifying unique selling points will help creating a development strategy that could differentiate the selected destination from its competitors and attract more tourists to the region, who are keen to know more about the astro-related phenomena that can be experienced.

Marketing Mix

Marketing mix, also known as 4Ps of marketing, is a theoretical framework of achieving a successful marketing of a product or service (Twin, 2022). Introduced in the 1950s by Neil H. Borden, the marketing mix consists of product, price, place and promotion. Despite the recent development and transformation of 4 Ps into 7 Ps (added people, process and physical evidence) (Twin, 2022), this paper will only focus on the classical four-point approach to the marketing mix. The additional three elements will not be used in this thesis, because they help to market products and services, after getting to know the entire structure of the organisation which is not possible to achieve in this project due to limited resources. The idea of marketing mix is to help businesses and organisations to achieve widespread adaptation of a specific product or service – with which help it will be possible to create a marketing strategy that will adapt astrotourism to the current state of tourism in North-western Jutland.

Although, astrotourism can be viewed both as an industry that offers to experience night sky as a product, it can also be viewed as a final product that consists of several elements.

1. Product. This element of marketing mix refers to the tangible or intangible goods, services or experiences, which are being offered to a customer. A product itself is a representation of all the elements that create finished product or service, which include design, packaging, quality, features etc. At this stage, a smart product can be developed based on the customers' needs and interests that can be differentiated from other competing businesses within the specific industry.
2. Price. Despite price being the cost customers pay for the product, it must be competitive and attractive – at the same time, generating revenue and profit for the business. Although, the complexity of products/services/experiences within astrotourism can easily affect the price, because of their unique timing and experience elements in comparison to other outdoor products. There are different strategies that price can be built upon.
3. Place. The place element refers to the physical location, where a specific product or service can be experienced. In the case of astrotourism, it is essential to choose a location with as low level of light pollution as possible in order to provide guests with the best stargazing experience. Besides, accessibility in the night-time and infrastructure must also be considered.
4. Promotion. The promotion element refers to any type of activities a company or organisation does to advertise their products or services. Such are paid promotions, advertisements, public relations, promotional events, collaborations with influencers/advocates, image sharing on social media etc. The main goal of promotion is to highlight unique features of a product, which could be witnessing Northern Lights or learning about the night sky accompanied by a professional guide.

In conclusion, the marketing mix is a theoretical tool, which can be used to achieve both development and visibility of astrotourism addressed to the mass public. A well-structured marketing strategy can help to attract visitors to North-western Denmark and create relations between the area's wonderful night sky and customers' needs for unique experiences.

Philosophy of science

In this chapter multiple aspects of the thesis will be presented framing the research from a philosophical point of view, describing the research design and data collection in order to offer a clear viewpoint on the scope of this thesis.

To frame the project, several philosophical concepts will be presented reflecting on the thesis and its subject. Thomas Kuhn (2017), who has been among the first ones using the term of research paradigm, defines it as philosophical way of thinking. In research it reflects the researcher's worldview, perspective and shared beliefs, which define research from the problem formulation until the conclusion. Meanwhile, it is an important and leading factor in choosing the data collection methods and way of analysing the data (Kivunja & Kuyini, 2017).

According to Baroudi, paradigms can be defined by three assumptions about:

- Physical and social reality – reflecting to the ontological stance,
- The nature of knowledge – reflecting on the epistemology and methodology,
- Relationship between theory and practice – the purpose of doing research (Orlikowski & Baroudi, 1991).

Following this theory, different aspects of research paradigm will be presented with the reasoning of the choices made.

Research paradigm

A research paradigm refers to the overall worldview, the basic belief system, which is based on the ontological, epistemological and methodological assumptions (Guba & Lincoln, 1994). This project follows the characteristics of constructivism. A researcher makes effort to understand and to interpret an individual's assumption about reality and their interpretation of the social world. Therefore, reality is constructed by the multiple viewpoints of the participants. In this paradigm, a researcher gathers and analyses data consistently with the help of grounded theory (Kivunja & Kuyini, 2017). Constructivists aim to understand how an individual's experience is being constructed within the social world and the meaning-making processes. Even though darkness exists as a natural phenomenon, the subject of the research is to unveil the assumptions of the participants, which can vary since they have different experiences and backgrounds that might affect the opinion they have on this phenomenon.

Ontology

Ontology is a branch of philosophy, which refers to the existence of reality. It is concerned with the nature of the assumptions that are made in order to believe that something is real and makes sense. It helps to conceptualise the form of reality and what can be known about it; it is essential for the research paradigm since it defines the things that constitute the world as it is known. Crucial questions to be asked in order to define the ontological stance are: is there one single reality in the social world or there are multiple realities? Is it constructed? Is it objective? These questions lead to the assumptions about the social reality and help to understand the data and to highlight its significance (Kivunja & Kuyini, 2017).

In the case of this paper's ontology, where the main goal is to understand different interpretations of darkness as a phenomenon, the subtle realism ontology has been used. According to the SAGE Encyclopaedia of Qualitative Research Methods (Madill, 2008, p. 7), subtle realism is a middle ground between the naive realism of naturalism and the relativism of postmodern approaches. The subtle realist approach takes point in the fact that our world consists of many independent phenomena, but it argues that we don't have direct access to them, which is why it can be used in social sciences (Madill, 2008, p. 7).

Any natural phenomenon exists independently from humans' minds, but it also has its own qualities and effects on the way how people experience and understand the phenomenon. Therefore, subtle realism accepts that physical nature of darkness and the night sky do not exist as a fixed reality, but it consists of several non-physical aspects that are based on the people's perceptions.

There are several aspects that affect people's subjective experience of darkness, such as surrounding environment, personal fears or cultural background. Therefore, it is expected to see multiple interpretations of the same phenomenon, depending on the interviewees' previous experiences, awareness, knowledge and personal values. The ontology of subtle realism is able to help this research to gain a detailed and nuanced understanding of darkness as a natural phenomenon of our environment, which then will be used to create a tourism development strategy focusing on the subjective experiences.

Epistemology

In Greek *episteme* means knowledge. When we put it into research frames, epistemology means the way how we get to know something or how we know the truth or reality.

Epistemology is concerned by the questions such as: can knowledge be acquired, or one needs to experience it? What is the relationship between the known and the would-be known? These questions help the researcher to place themselves in a position to choose what is new and what is already known, which is highly important in the research field to contribute to new knowledge in tourism literature in this case (Kivunja & Kuyini, 2017).

In this thesis, the subjectivist epistemological stance is emphasised since the knowledge was produced by studying people's beliefs and interpretations about the darkness in their social world, which was analysed by our research team aiming to find patterns and nuances in their answers. As soon as the researchers are part of the processes of data collection and analysis, and even though they might not be aware, they bring in their past experiences and impression when going through the steps of data collection and analysis of the research. Therefore, it can be claimed that understanding of the reality and knowledge constructed by the researchers is a result of the social world and personal experiences, which is a subjective process (Kivunja & Kuyini, 2017).

Methodology

Methodological assumptions refer to the question of how the researcher can find out what can be known. The answer to this question is already included in the epistemology and ontology, since they refer to the nature of reality and the way how the researcher reaches it. In this project the hermeneutical and dialectical methodology is used. This refers to the fact that constructions can be unveiled only by interaction between the researcher and the interviewee. The researcher aims to track the process of the meaning-making of the concepts of darkness by the participants. These constructions are interpreted and analysed using a hermeneutical technique and compared through a dialectical interchange. The final aim is to reach a consensus, which includes multiple nuances and reflects on the differences of many constructions (Guba & Lincoln, 1994). Because the researcher is seeking to find nuances and to unveil the process of meaning-making, the methods used in natural sciences are not capable to uncover refinements of the constructions. Therefore, in this project, collection of

qualitative data is used as primary data in order to get in-depth views on different individual understandings of darkness.

Research design

As claimed by Toshkov (2016), “*research design ensures that the answers we provide are as valid as possible and discovered as efficiently as possible*”. For this project the case study design is used to build up a detailed and intensive research of the case of tourism development project in North-western Jutland, highlighting the complexity and unique features of this research. Often, case studies tend to include qualitative methods, because this type of data collection allows the researcher to get deep knowledge on the case and explore its complexity. The term “case” refers to the study of a particular location, community, organisation etc., and the focus interest is only aiming to this single subject (Bryman, 2012).

Further on, this research follows the abductive research approach, which means that the researchers are seeking for finding the best possible explanation or hypothesis for the proposed research question. In contrast to deductive reasoning that begins with a theory applied to a specific case, or inductive reasoning involving observations, concluding patterns or generalisations – in the case of abduction, the starting point is an incomplete data collection, which is followed by the most plausible explanation for that. The main goal of an abductive reasoning is to conclude an explanation or hypothesis, which is consistent with the available data and can be used to guide further investigations or decision-making processes (Hassan, 2023).

In this project the starting point was identifying the need for development in North-western Jutland, which was followed by getting a more detailed research based on the websites of the local DMOs and getting in contact with the CEOs in order to find out organisations’ future vision for the management of each destination. Our hypothesis states that introduction of astrotourism will be beneficial for the selected area and it will line up with the DMOs’ vision by following the concept of sustainable tourism. The literature review on this subject has demonstrated that this kind of tourism can help to develop tourism in the selected area without harming the environment. The interviews with potential tourists highlighted the interpretations of darkness and helped to transform them into a value proposition for marketing of the place and differentiation from the neighbouring destinations.

Data collection

Primary data

The primary data for this project was collected at three stages:

1. getting in touch with the relevant organisations,
2. interviewing potential astrotourists, and
3. observing guests.

At first, it was important to establish contact with the relevant organisations that represent or are heavily related to tourism in the region. As it was mentioned earlier, the selected part of Jutland is divided between three municipalities – Struer, Morsø and Thisted, although there only two DMOs that cover the area – Destination Limfjorden and Destination Nordvestkysten. In order to find out the vision for the destinations' development, but also to investigate potential cooperation between those two DMOs, there was established contact with the CEOs of both organisations, Kristina Lehmann Schjøtt and Peter Krusborg Pedersen. Peter Krusborg was interviewed via phone call, while we had a very brief conversation with Kristina Schjødt, where it was asked if Destination Limfjorden could be interested in working with astrotourism in cooperation with the neighbouring DMO. The conversation was not recorded since a short positive answer was received. In the case of a phone-call interview, it is an effective way of collecting primary data since it allows both the interviewer and the interviewee to be flexible both in terms of space and time. Especially, considering the extensive workload and busy schedule of a CEO, our project team took the given opportunity to ask Peter Krusborg the needed questions via phone call. Conducting an interview via a phone call makes it easier to go through the logistical obstacles, but it also makes it easier to get in contact with an interviewee who lives further from the investigated area, which helps to reduce the costs and time of transportation. Moreover, a respondent does not get distracted while the researcher takes notes and can fully focus on the ideas to share (Drabble, Trocki, Salced, Walker, & Korcha, 2016). In opposite to in-person interviews, during a telephone interview it is not possible to see the gestures or mimics, but in this research, we were focusing on the verbal message of the two CEOs to gain more knowledge on their destination, rather than non-verbal signals.

Another important organisation in this region is The Danish Nature Agency (*Naturstyrelsen*), because of the presence of National Park Thy (NPT) that covers 244 km² from Hanstholm to Agger Tange in Thy (Fogh-Andersen, Politikere siger nej til udvidelse: Nationalpark Thy er stor nok , 2022). To investigate the national park's vision for the future development and their view on the use

of darkness and night sky as a tourist attraction, an e-mail interview with the chairwoman of NPT, Else Østergaard Andersen, was conducted (Appendix 4).

The fourth crucial party in this case work is *Hawboernes Forening*, an association of locals living in the village of Lild Strand, which can be found West from the Bulbjerg Cliff in Northern Thy. This association is important, as their initiative behind applying for becoming Denmark's second International Dark Sky Park was approved at the first stage and the final certification is expected to be approved during the on-going year of 2023 (Fogh-Andersen, 2023). The data collection focused on understanding the vision of the area's use at night through an in-person dialogue with the chairwoman of Hawboernes Forening, Anne-Mette Kristensen (Appendix 6).

The second stage of primary data collection was conducted with the help of structured interviews, which aimed to discover different understandings of darkness and the potential application of them for different development types. The interviewees, who participated in the structured interview, were volunteers willing to participate in data collection. Two posts, calling for interviewees, were posted on two social media platforms – Facebook and Instagram, meaning that it was impossible to predict who the interviewees would be. Although, those two posts were published on our personal profiles/channels, it was highly expected to see people volunteering to be interviewed from the friend or follower list. At the same time, as one of the project team's member is considered to be an influencer within the field of astrophotography (Christensen, 2022), it was expected to see the results being affected by the number of interviewees who might have some interests related to astronomy.

The structured interviews were carried out online (online audio calls) in order to reach a broader sphere of the domestic tourists and overcome the geographical boundaries, which made to reduce the costs and time of transportation. This way was more convenient to collect the data, since it gave more flexibility, and it was easier to find a timeslot which was suitable for both the respondents and interviewer. It is found that in general online interviews boost the engagement, since the respondents are at a familiar environment, and they are keener on talking about personal experiences or sensitive issues. However, online interviews can be influenced by the speed of the internet or the IT skills of both parties, but we did not have to cope with these kinds of issues (Clements, 2022).

Each structured interview consisted of 13 questions (Appendix 3), where at first general questions were asked to collect some general characteristics of the interviewee, such as their age, gender and

place of residence. Further on, a set of more personal questions was asked in order to map the interviewees' view on darkness by understanding their interests and backgrounds. Besides, a set of questions was asked to get an insight into the interviewees' view on light pollution and sustainability, which could help this project to create the most suitable development strategy for tourism development in the region, based on the case study. By identifying interviewees' gender, it would be possible to see a potential correlation between it and a potential fear of darkness – but also, a different view on sustainability, as females are seen to be more aware of the need of a sustainable development (Hunt, 2020). At the same time by looking at the interviewees' place of residence, it would be possible to draw a parallel between it and the view on darkness (elements such as safety/unsafety) and need for reduction of light pollution.

Since the aim of conducting structured interviews was to gather qualitative data, it provided this project with deep understanding of people's thoughts that are connected to darkness and light pollution. Additionally, it was about getting detailed and nuanced insights on the different themes mentioned earlier, and to understand the overall image of people's views on the subject through the process of a thematic analysis. In total, 17 structured interviews were conducted. Through the thematic analysis, it was possible to get an overview on people's opinions, knowledge and values of different subjects that interviewees were asked about. This type of analysis allows the researchers to have some flexibility in interpreting the data and sorting it into themes going through different steps in the analysis. There are six steps to take in order to get to the main takeaways and the answers for the problem formulation (Caulfield, 2019).

The six steps are the following:

- Familiarisation with the answers of the respondents by reading transcripts of the interviews several times;
- Coding – refers to highlighting different sections of the text and putting labels on these sections to describe their meanings;
- Generating themes – by looking at the previous labels we can find patterns in the texts and therefore, we are able to come up with themes that describe different labels best;
- Reviewing themes – making sure that themes cover the answer to the first question of the problem formulation;
- Defining and naming themes – this step refers to the action of correcting the names of themes to be straightforward and to avoid any misunderstandings;

- Writing up – the findings section covers all the themes that we discovered throughout the analysis. In the interviewees' interpretation of darkness, we use quotations from the interviews in order to strengthen the given argument. The conclusion should give responses aiming to give answers to the research question, or at least to some part of it (Caulfield, 2019).

The third set of primary data collection focused on collecting information about astrotourists' behaviour through field observations during three arranged stargazing tours. In connection to Destination Nordvestkysten's plan to arrange 100 different experiences throughout Easter Holidays, the DMO approached one of our research team's members with a request to arrange several guided stargazing tours in the area around Bulbjerg, the upcoming Dark Sky Park. After some discussion and planning, it was agreed to arrange three guided tours under the night sky on April 6th, 7th and 8th. Each tour had a maximum capacity of participants set to 15 people/tours and the tours themselves were planned to take approximately 2,5 hours. Because there was only one of the project team's members participating, who at the same time had a role as a guide, it was not possible to make notes of the participants' behaviour – which also could have affected data collection. Instead, participants were observed (their age group, engagement, type of asked questions and behaviour) and by the end of each tour – photographed as a group under the night sky. As it requires light to make notes in the dark environment and it is easy to get distracted and lose contact with the guests, it was chosen to do photographic documentation of the participants.

One of the key elements in this set of data collection was the opportunity to get in direct contact with actual astrotourists both as a guide, but also a researcher. It was a great opportunity to research the level of interest in this type of activity and the first impression of the tourists. This connection with guests happened through the real-life events, marketed as an activity by the DMO, where tour participants were not notified about being "observed", since it could also have affected data collection, because people might have acted differently.

Secondary data

In general, secondary data refers to already collected and published information, which is done by others. For researchers it can be useful to apply secondary data, as it can save different resources (time, money), although it is important to stay critical by looking at the origin of the source, its author, place of publication, purpose, message etc. The secondary data in this project is gathered

from different scientific websites as well as official informational platforms and databases with statistics.

In order to understand, whether the selected part of Denmark is suitable for introduction of the concept of astrotourism, there was a need to analyse the level of light pollution, which was done with the help of the light pollution map, found on the website *lightpollution.info*. This website was useful in regards finding the area that is the least impacted by artificial light and which gives an opportunity to experiencing naturally dark skies. The website presents visual data of the artificial light at night, which is collected by different spacecrafts through the years and is considered to be scientific, quantitative, data.

After that step, it was needed to carry out desk research on the websites of the two DMOs: Destination Nordvestkysten and Destination Limfjorden. Their development and marketing strategies for the next couple of years served as the starting point to finding out their direction and aims in tourism development in order to be able to build astrotourism in their existing values and goals.

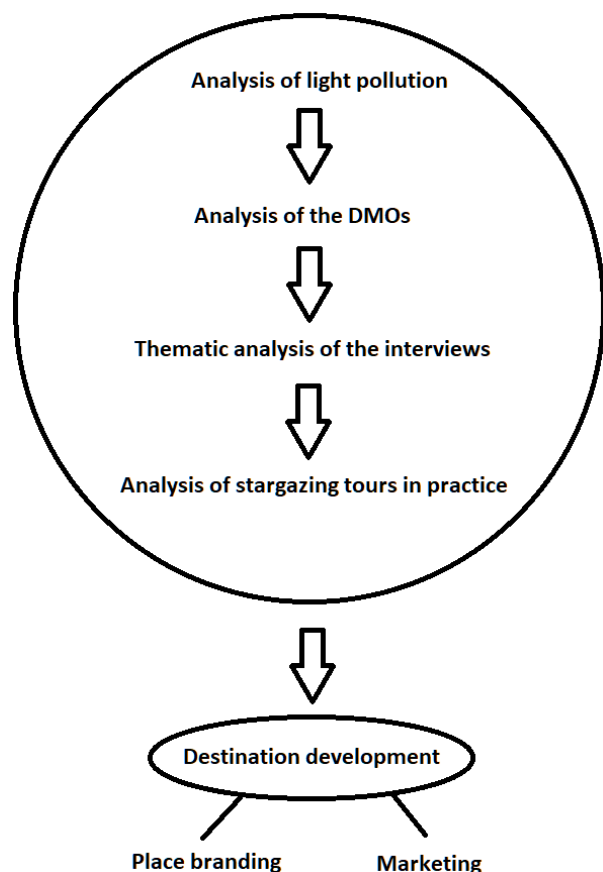
Additionally, we have located the most popular tourist attractions and researched the DMOs' websites to find out visitors' motivation to visit the destinations, the vision of different local organisations on the future development and offers in regards services and activities.

Moreover, to gain a general insight of tourism in Denmark and in the selected region, multiple databases with statistics have been reviewed to have an overview on the number of tourists, seasonality of tourism and target markets of the selected destination. Statistics played an important role in the situation analysis to understand tourism as an industry in the selected region, which helps to identify the demand of different products and services.

Analysis

The analysis section is split into several parts. Firstly, it is important to present the scene around the current light pollution situation in Denmark in order to understand weaknesses and threats, which can have an effect on the realisation of the project. It is done with the help of secondary data, where news articles and Danish laws are reviewed and analysed from the perspective of astrotourism. Although legislation and tourism policies are not among the themes of this project, it is still important to know about darkness/sky protection in Denmark, if such exist, which also serve combined with the further findings as a crucial input for the discussion. Using secondary data, a detailed analysis of the country's light pollution map is done in order to clarify project's relevance for the selected area of North-western Jutland but also to understand whether there are any points for differentiation as an astronomical destination.

After the first chapter of the analysis, it is important to complete a situation analysis of the selected area from the tourism perspective. As it was mentioned earlier, there are two DMOs that are responsible for the managing and marketing of the area, therefore it is possible carry out the analysis with the help of primary and secondary data. The information for the analysis was primarily collected through DMOs' websites, where development strategies along with the organisations' values are acquired. Because some statistics cannot be found on the DMOs' websites, databases such as Danmarks Statistik and VisitDenmark's Knowledge Centre also are used to acquire data about tourists in the selected



destinations. To supply this part of the analysis with additional details and nuances about destinations' vision for the future development, secondary data is combined with primary data, which is acquired through approach of both CEOs.

To get an actual understanding of darkness and dark-sky experiences from the viewpoint of potential guests, the following part of the analysis is split into two parts – a theoretical thematic

Figure 13. Visualisations of the analysis' structure

analysis based on the interviews and practical analysis of an event based on the observations. With the help of 17 in-depth interviews, it is possible to answer on the first part of the research question, while analysis of the real-world event shows a real image of astrotourism in the selected region.

By the end, in addition to the project's complex analysis, there are added elements of place branding and marketing mix that serve as a possible guideline for the local DMOs, which are guided to implement darkness into their strategies to develop tourism.

Light Pollution in Denmark

Light pollution is a rare topic that appears both on the political agenda and in the news media, when it comes to discussing environmental issues – also in Denmark.

In January 2022, Danish news channel TV2 has published a big story, which focused on the issues related to light pollution (Gotfredsen, 2022). One of the main reasons behind this news report was local citizens' attention to the strong artificial light being emitted from commercial gardening houses that could be seen from a dozen kilometres away. The specific case, which the article was about, focused on the island of Funen, where most of the Danish gardening greenhouses can be found (Danmarks Statistik, 2021). The TV2's article talks about locals being annoyed by the strong light, but also afraid of environmental damage, because of light pollution caused by the greenhouses. One of the interviewees told the reporter how artificial light affects his life in a rural place that used to be dark enough to see the stars every night:

“...But now I am on the countryside, where it is dark and no light pollution. What I think is wonderful. The light is quite devastating for the environment out here. I actually prefer it to be dark during the night, so I can see the stars” – own translation (Gotfredsen, 2022).

According to the analysis of satellite data, which in 2016 helped researchers to create the World Atlas of Artificial Night Sky Brightness, 89,3% of Denmark's population live under light polluted sky and 38,5% of Danes can no longer see the Milky Way from their places of residence (Falchi F. , Cinzano, Duriscoe, & Kyba, 2016). Although, the new report from January 2023 concluded that Europe's overall level of light pollution increases by 6,5% each year (Helmholtz Association of German Research Centres, 2023), it is logical to assume that number of people who are being affected by the artificial light in Denmark at night has increased since 2016.

Looking at the World Atlas of the global light pollution from 2016, while zooming in to Denmark, there can be clearly noticed contrast between Eastern and Western parts of the country, although

with some local exceptions. Major cities like Copenhagen and Odense (but also the large number of towns spread across the islands of Zealand and Funen) play a dominant role in contribution to the artificial sky glow at night East from Lillebælt.

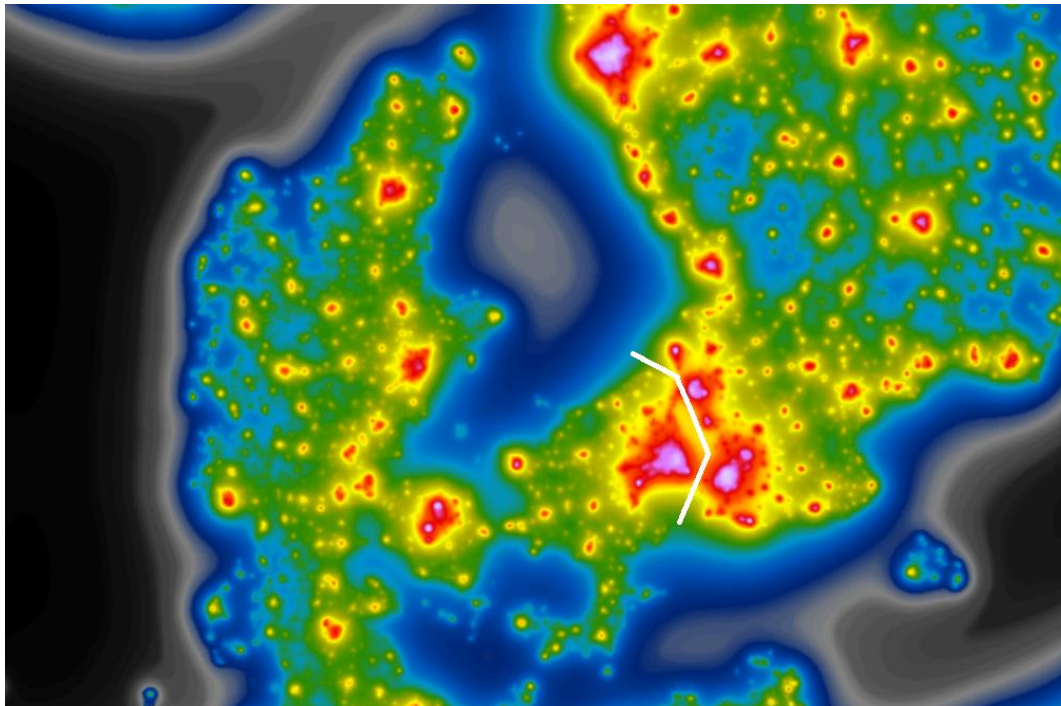


Figure 14. Light pollution map of Denmark (Falchi F. , et al., 2016)

The light pollution map of Denmark (Figure 14) shows the overall radiance emitted from all the artificial light sources at night, as seen by the satellites from space. The warmer the colour is, the more a dark environment is affected by artificial brightness and the other way around – the darker an area is shown on the map, the smaller level of light pollution can be experienced at night (Falchi F. , et al., 2016). The very close distribution of cities that were built with a small distance next to each other keeps the skyglow at a relatively high level (green and yellow colour, Figure 14), meaning a significant affection on the number of visible stars. Although, it can be clearly noticed how much the Danish West coast differs from the rest of the country in terms of light pollution level. Remote areas with smaller towns and larger distances between the cities, because of the landscape, are among the explanations behind this visible difference in the level of artificial sky brightness from the rest of the country. Since Denmark is surrounded by two seas, the North Sea and the Baltic Sea, the country has one of the longest coastlines among European countries, making up 7400 km in total (Nag, 2018). For the analysis of light pollution levels, it means that there can be found many locations with dark horizon, making it possible to experience dark environment and stargazing not so far from a big city – although with a noticeable skyglow.

Dansk Naturfredningsforening (The Danish Society for Nature Conservation), the largest nature conservation and environmental organisation in Denmark, has created a list of the areas across Denmark, where one can experience great dark-sky conditions (Danmarks Naturfredningsforening, 2011). The mapping of these areas showed a correlation between the lack of artificial light pollution and protected natural areas – with the vast majority of dark-sky spots being located in Jutland (Danmarks Naturfredningsforening, 2011). Although, this data was analysed with the help of satellite images taken from 2007 to 2009, meaning it might be outdated as the results were published several years before the World Atlas' release, as well as the newest report on the escalation of the global level of light pollution from January 2023. Though, it can be still seen that Jutland's West coast remains the largest area with the lowest level of light pollution in the entire country.

Protection of environment at night in Denmark

According to the earlier mentioned news story published by TV2 in January 2022, there are no regulations that set a limit for the allowed light pollution on the national level in Denmark (Gotfredsen, 2022). The news media writes that light pollution is not even mentioned in Danish Environmental Protection Act (*Miljøbeskyttelsesloven*):

“...Because light pollution is not mentioned in the Environmental Protection Act at all and there do not exist any limits for the light pollution in Denmark” – own translation (Gotfredsen, 2022).

A Danish website “*Lysforurening i Danmark*” (Light pollution in Denmark) has an overview of the existing laws that prevent or help to reduce different types of pollution (Aldrich, Regler, n.d.). The website is written and updated by Per Tybjerg Aldrich, a Danish civil engineer and amateur astronomer, as his free-time project that has started back in the 1980's (Aldrich, Om, n.d.). The Danish Environmental Protection Act is also mentioned on the website of lysforurening.dk as a law that must protect sustainable development of the society with the focus on the reduction of any kind of noise and pollution, although light pollution hasn't been mentioned in this act (Aldrich, Regler, n.d.).

“The law must contribute to protection of the country's nature and environment, so the societal development can be done on a sustainable basis with respect to humans' living conditions and preservation of wildlife and vegetation” – own translation (Retsinformation, 2013).

As a fact, the Danish Nature Protection Act (*Naturbeskyttelsesloven*) has a paragraph mentioning light pollution in Denmark, though only regarding advertising and illuminated advertising in the open land:

“§ 21. In the open land, the installation of posters, pictures, freestanding signs, illuminated advertising and other decorations with the aim of advertisement and propaganda is forbidden. Signs informing about services and tourism information boards, which are installed by the authorities in regard to the road traffic rules, shall not be considered as an installation with the aim of advertisement and propaganda” – own translation (Retsinformation, 2018).

Although, this paragraph doesn't clarify what “an open land” is and what zone status must the area be – whether it is an urban area or a countryside. And in addition, the Danish Nature Protection Act only mentions some specific protected types of nature, which the act affects – but dark environment and night/starry sky are not among the list (Retsinformation, 2019).

There are other acts and laws within the Danish legislation, which in one- or another-way mention lighting (such as Road Act, Construction Act etc.), but this project will only focus on the Nature and Environmental Protections Acts because of the relevance.

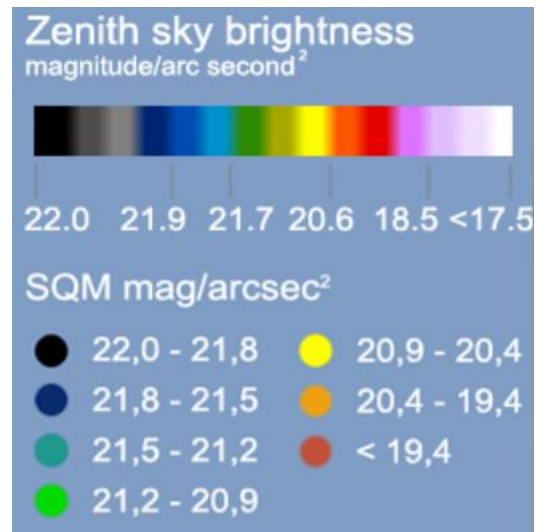
“The dark Jutland”

The Danish expression “*Det mørke Jylland*” (Dan. for “The dark Jutland”, own translation) has been circling around the Danish society since the end of 19th century, which some sources mean, was created by some Copenhageners who made fun of the Western part of Denmark (Abildlund, 2014). According to the general definition of this quote, at that time Jutland was seen as “culturally darkened”, meaning that people across the entire area were considered less cultural compared to the capital of Denmark (Abildlund, 2014). At the same time, Jutland has less inhabitants, and cities are widely spread across the mainland in comparison to Zealand – this connection was found in the Henry Morton Stanley's title of his book “Through the Dark Continent”, which in 1888 was translated to Danish and was quickly optimised to the people's view on Jutland as a “dark mainland” (IrmingerSonne, 2002).

From the perspective of darkness in terms of light pollution and quality of the dark environment, Jutland has slightly better dark-sky conditions in comparison to Funen with its islands, as well as Zealand with its islands. Although, there are almost no major cities that spread along Jutland's West

coast, it was still decided to analyse light pollution levels of the entire peninsula in order to match the expression “The dark Jutland”.

With the help of tools that are integrated on the website *lightpollutionmap.org*, it is possible to select a specific area by drawing a polygon and an information window will pop up, showing the radiance details of the selected area. The most important number in that window is the mean value of the predicted zenith sky brightness, which is measured in magnitude per arcseconds squared ($\text{mag}/\text{arcsec}^2$) that describes quality of the night sky – the higher the value is, the



darker is the sky at night (Figure 15) (Unihedron, n.d.).

Figure 15. Light pollution map legend (Stare, n.d.)

In 2001 to make the understanding of values easier, an American amateur astronomer, John E. Bortle, has created a Bortle Scale classification that tells the quality of the night sky – where Bortle Class 1 represents an Excellent Dark-Sky Site and the classification stops at the Class 9, representing an Inner-city Sky (Figure 16) (Bortle, 2006).

Number Code	Map Color Code	Label	Sky Mag.
1		excellent dark sky	22.00–21.99
2		average dark sky	21.99–21.89
3		rural sky	21.89–21.69
4		rural/suburban transition	21.69–20.49
5		suburban	20.49–19.50
6		bright suburban	19.50–18.94
7		suburban/urban transition	18.94–18.38
8		city sky	< 18.38
9		inner city sky	.

Figure 16. Using Bortle Scale to define magnitude of the sky brightness (MacEvoy, n.d.)

The polygon drawn around Jutland and its islands in Kattegat, Læsø and Samsø, covers an area of total 46378 km² and the sky at night has a mean value of 21,59 mag/arcsec² (Figure 17). This value corresponds to the Rural/suburban transition – or a Bortle Class 4. Despite Århus being Jutland's biggest city and Denmark's 2nd largest city (Gregersen K. , 2022), the highest value of the sky magnitude reaches 19,24 mag/arcsec² corresponding the description of bright suburban environment (Figure 16 and 17).

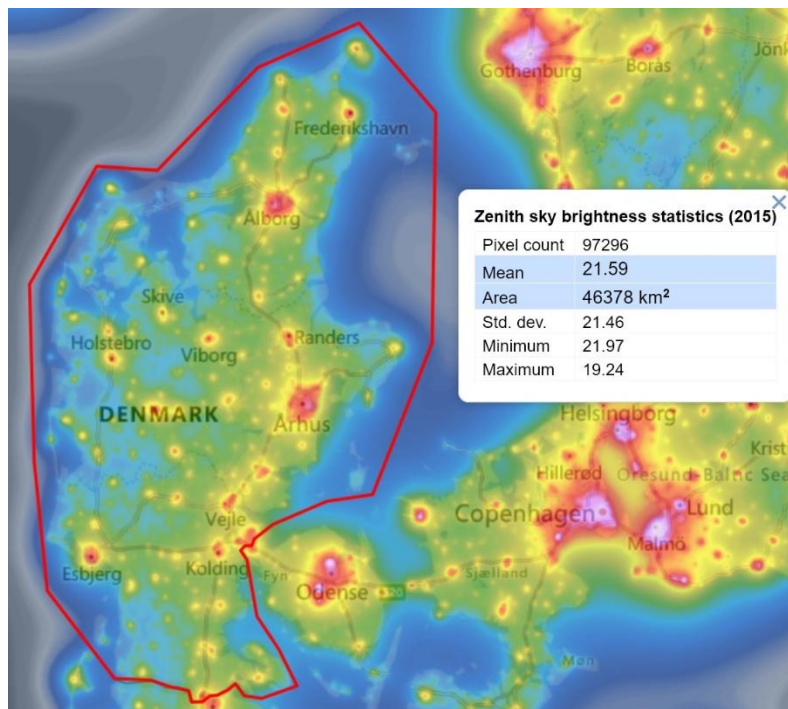


Figure 17. Light pollution map of Jutland and islands (Falchi F. , et al., 2016), (Stare, n.d.)

The analysis of the light pollution level in the selected area around Funen, including its biggest islands Ærø and Langeland, shows that mean sky brightness is only 0,37 mag/arcsec² brighter, which is still capable to be characterised as Bortle Class 4 (Figure 18). Although, the remote islands of Ærø and Langeland appear as blue/dark-blue areas on the light pollution map, meaning, including them into the analysis affects the average value of the zenith sky brightness. Despite this fact, the maximum magnitude of the sky brightness reaches the value of 17,79 mag/arcsec² or the Bortle Class 9, appearing as John Bortle's description "*the entire sky is brightly lit, even at the zenith*" (Bortle, 2006).

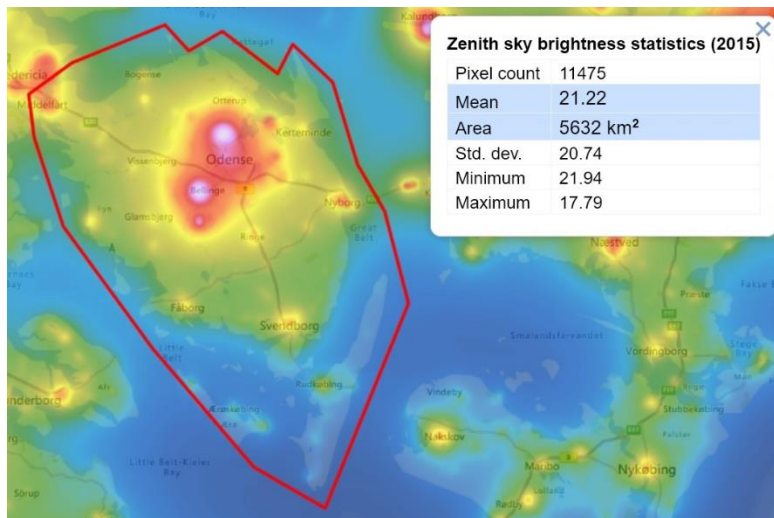


Figure 18. Light pollution map of Funen and islands (Falchi F. , et al., 2016), (Stare, n.d.)

Lastly, the mean quality of the night sky on Zealand and its islands is nearly identical to Funen, since smaller islands of Falster, Lolland and Møn (Dark Sky Park) slightly reduce the high value of average sky magnitude (Figure 19). Despite the fact that Zealand's maximum sky brightness only reaches 18,10 mag/arcsec² in comparison to Funen, it still is being classified as the lowest tier on the Bortle Scale, where at night it is possible to read newspaper headlines without difficulty (Bortle, 2006).

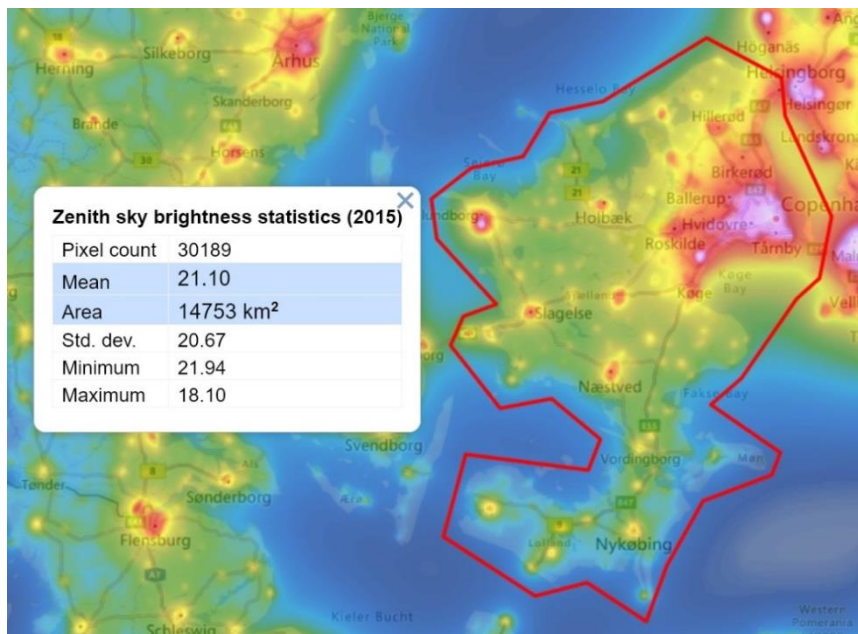


Figure 19. Light pollution map of Zealand and islands (Falchi F. , et al., 2016), (Stare, n.d.)

	Jutland	Funen	Zealand
Min (mag/arcsec ²)	21,97	21,94	21,94
Mean (mag/arcsec ²)	21,59	21,22	21,10
Max (mag/arcsec ²)	19,24	17,79	18,10

Figure 20. An overview of the radiance values

As a conclusion of this chapter, it can definitely be said that Jutland is the darkest region of Denmark – where it is possible to experience stargazing in far more areas than on Funen or Zealand according to the analysis of light pollution levels. The brightest area in Jutland only reaches the level of Bright Suburban (or Bortle Class 6), while some parts of Denmark, East from the Lillebælt, are placed in the bottom of Bortle Scale – meaning, it is nearly impossible to get any night-sky experience. Although, all the regions have some areas with an unspoiled dark-sky environment.

Despite Jutland being the darkest region in Denmark, the increasing urbanisation of cities as well as lacking protection of the night sky contributes to a rising levels of light pollution, which can affect quality of darkness in the long run.

Light pollution levels in North-western Jutland

Since this research project focuses on the specific region, which is being represented by Thy-Mors area, it is important to analyse region's light pollution levels as well. As it can be seen on the map (Figure 21), the selected area is being affected by the dominant presence of water bodies – Limfjorden and the North Sea. They help to maintain the uninhabited area of the region, which prevents the potential rise of light pollution. The cities Nykøbing Mors, Thisted and harbour-city of Hanstholm, are responsible for most of the emitted artificial light at night, as the figure below shows (Figure 21). Although, responsible lighting, presence of the National Park Thy and long distances between the smaller cities keep the mean level of Zenith sky brightness at 21,81 mag/arcsec² and the maximum level of 20,60 mag/arcsec² that responses to the upper classification of night-sky quality. With this data, it is easy to make a conclusion that nights in the selected region are dark, since light pollution has an impact on the sky quality only few places near the larger cities. Moreover, this analysis concludes the relevance of working with the selected region as the case work for tourism development by focusing on darkness and using it for introduction of astrotourism for the general type of tourists.

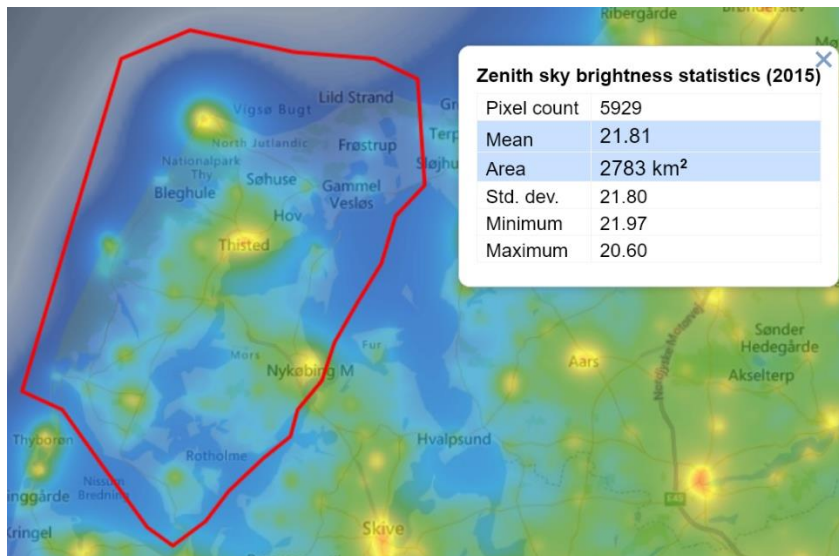


Figure 20. Light pollution map of the North-western Jutland (Falchi F. , et al., 2016), (Stare, n.d.)

Analysis of the DMOs

As concluded through the analysis of the light pollution map, in the selected region it is possible to experience darkness and the night sky of an exquisite quality. Although, before getting started to work on an implementation of astrotourism into the region's tourism development, we need to analyse the strategy and vision of the DMOs that represent tourism in the area. As it was mentioned earlier, in the context of tourism, the chosen area is represented by two DMOs – Destination Limfjorden (DL) in the East and Destination Nordvestkysten (DN) in the West. Such division of the entire country into different destinations happened back in 2019 in connection to the Danish Government's Law of Business Promotion, where different geographical and municipal areas were merged into new, bigger, DMOs (Danmarks Naturfredningsforening, 2011). This new division of Danish destinations was based on the political decision, meaning in the case of this project, there are three municipalities (Thisted, Struer and Morsø) that can affect DMOs' decision-making and development strategies.

Destination Nordvestkysten

Geographically, the DMO of Destination Nordvestkysten is Denmark's second largest destination. According to VisitDenmark's annual report from 2022, the main attraction of the DMO is nature- and coastal tourism, and the main type of accommodations preferred by tourists is rental of summer

houses (Danmarks Statistik, 2023). The DMO has a strong international profile, since 46% of the total turnover comes from foreign tourists. This can be explained by the strategic location and experience opportunities in the nature – the Danish west coast is a beloved place to go on a vacation for many German and Dutch tourists (Sølvsten, 2022), but also Norwegians because of short distance from the port town of Hirtshals (Smidt, 2022). For Germans, one of the most unique and important features in the area is the unlimited opportunity to stay on the beach and some places it is even possible to drive right next to the North Sea (VisitDenmark, 2019).

As the organisation claims, its primary target group are families with children with a special interest in coastal- and nature tourism (Destination Nordvestkysten, 2021). Since astrotourism is represented by the combination of science and experience of the night sky out in the natural environment, it is possible to assume that DN's primary target group could also be interested in the introduction of this new experience initiative in the area.

Based on Destination Nordvestkysten's development strategy for the years 2022-2023, there have been set five milestones, which shape the following working mechanism for the future:

1. Green and sustainable tourism – focusing and operating with all three dimensions of sustainability (environmental, economic and social) in order to be beneficial both for the tourists, but also local citizens.
2. Strategic collaborations in the long run – strengthening of the collaborations between the actors in the sector, which would lead to a long-lasting development in Danish tourism sector.
3. Building a strong and attractive destination – focusing on the demands of tourists in order to develop better products and services.
4. Investing in an attractive tourism destination – creating collaborations (public, private) between the actors in order to become a more attractive and strong destination.
5. Marketing and tourist information – the development phase must be followed by marketing. This will happen in strong communication with the businesses and professionals in order to keep the existing target group, but also to attract new visitors (Destination Nordvestkysten, 2021).

From the interview with DN's CEO, Peter Krusborg Pedersen, which happened in February of 2023, a set of new information was obtained (Appendix 2). As the introduction of this thesis states, tourism in Denmark is highly dependent on the number of guests arriving during summer holidays,

meaning a disbalance in the industry throughout the year. Peter Krusborg mentioned that in Denmark, people always have connected cities as places that can be visited any time of the year no matter weather conditions, while nature is viewed as a destination to visit only on a sunny day (Appendix 2). Although, recent changes in trends, among which are post-Covid travelling trends, have made people to reconsider this view on nature that resulted in more guests visiting coastal- and nature destinations during the “shoulder” seasons (Spring and Autumn). And because of this uneven spread of tourists visiting DN’s areas, according to Peter Krusborg, 90% of the marketing budget goes to promoting the destination during time outside the high season, as “*during summer period people come here anyway*”. Following the theories of place branding and experience economy, marketing must be considered as the last stage in business development, as it is important to have a product before marketing strategies can be developed. As mentioned earlier, the uneven spread of tourists visiting DN shows a drop in the number of arriving guests, corresponding to 88% loss between high and low season (Figure 22). Among the explanations could be the closed campsites from September to April, as they constitute 20% of the preferred accommodation type (VisitDenmark, 2023, s. 11). Although the DMO works towards becoming a year-round destination, and there are several brands that focus on tourism during low season (such as Cold Hawaii), there is still a huge gap in the number of arriving guests that requires actions for improvement.

Overnatninger efter kapacitet, gæstens nationalitet, område, overnatningsform, periode og tid

	2022
Alle typer overnatninger	
I alt	
Destination NordVestkysten	
Alle typer	
Januar	136 230,00
Februar	228 239,00
Marts	214 647,00
April	513 033,00
Maj	436 654,00
Juni	707 688,00
Juli	1 455 007,00
August	1 150 607,00
September	583 423,00
Oktober	602 087,00
November	197 829,00
December	180 304,00

Figure 21. Number of overnight stays in Destination Nordvestkysten in 2022 (VisitDenmark, n.d.)

When the interview with Peter Krusborg has reached the topic of darkness and astrotourism as an innovative experience that could be implemented in the DMO’s existing development strategy, the

CEO of DN stated clearly from his point of view that astrotourism cannot stand alone as an individual product in the DMO's priorities, but it could be merged with other main experience categories within the existing strategy. Since DN is still working on the new strategy for the upcoming years, it was only possible to get our hands on the old strategy for 2022-2023 – although, on the organisation's webpage it was possible to find DN's five main focus points that shape future development:

- Insights that lead to actions
- A good story
- More experiences all year round
- The best guest service
- Political support (VisitNordvestkysten, n.d.).

Although among the development goals there can be seen a section pointing out the need for creation of more experiences to make the destination attractive for the tourists all year around, the CEO has explained the difficulty of working with astrotourism as an individual product because of “*several challenges*” (Appendix 2). But at the same time, Peter Krusborg did not deny that experiences under the night sky could become part of the destination's main attraction, where there already is focus on experiences out in the nature. The analysis of field observations in connection to the stargazing tours organised together with DN, which can be found in a following chapter, showed that tours had a high demand and were fully booked within few days after their announcement – which is a sign of wide interest among different groups of people. Following CEO's words, it is clear that, probably, one of the main challenges for working with astrotourism in Denmark considered to be weather conditions. Looking at the weather statistics, country's geographical location, and considering the effect of global warming, there are many days throughout the year when the sky is covered in clouds, following 62,5 mm of monthly precipitation on average (World Bank Group, n.d.). The guided tours in Bulbjerg were announced one month prior to the planned date of their realisation, meaning unpredictable weather conditions and risk of cancelling every tour, but it turned out to be a success – even though there was decent amount of clouds.

In the area there are already initiatives coming from the citizens targeting astrotourism and night sky preservation. Recently, the citizen association of Lild Strand, a small village situated West from the Bulbjerg cliff, has finished and sent an application to IDA in hope to become certified as

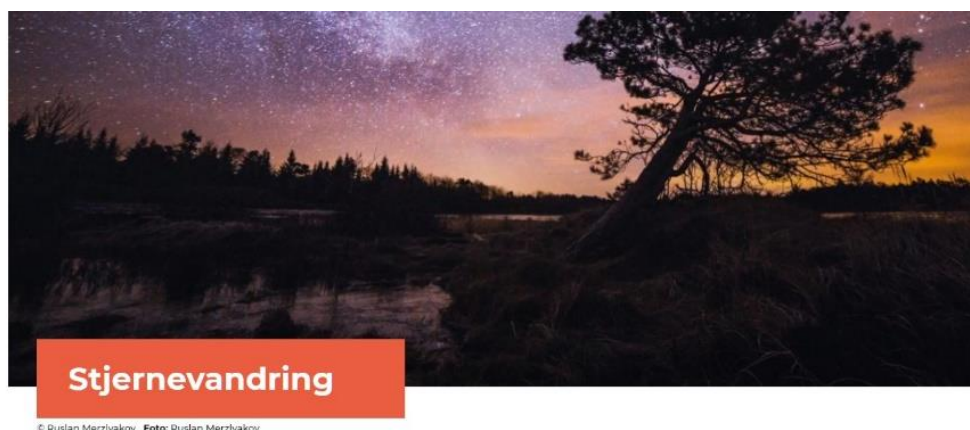
Denmark's second and Jutland's first Dark Sky Park (Hawboernes Forening, 2023). Among the letters of support from different organisations, Peter Krusborg, as the CEO of DN, wrote that the establishment of a Dark Sky Park around Bulbjerg will add a new dimension to the experience of nature, which follows DN's aim for development of new attractions:

“Tourists are becoming more and more conscious of the need for sustainability. Apart from providing visitors with an ever memorable experience of the dark of night, the Milky Way and the myriad of stars, a Dark Sky Park also puts focus on nature, biodiversity, human health and consequences of light pollution, thus stimulating curiosity and awareness, no matter if you are an adult or a child. For these reasons Destination Nordvestkysten fully supports the project and is looking forward to be able to advertise possibilities of nightly visits to a certified Dark Sky Park Thy in the northern part of Denmark.” (Hawboernes Forening, 2023, s. 20).

Following this quote, DN is planning to work with astrotourism despite having Peter Krusborg mentioning in the interview that Dark Sky cannot stand as an individual product in the destination. Thus, being part of nature experiences, there can be seen an opportunity to introduce astrotourism for the broader audience, being represented by the general group of tourists, who are not necessarily interested in astronomy.

Despite the CEO mentioning the consequences of light pollution, human health and biodiversity that stimulate curiosity and awareness among different target groups, the earlier chapter in the analysis section showed that night sky in entire Denmark is under a threat because of lacking legislations and attention from the political side.

As of mid-April 2023, DN has not published anything that mentions star-, dark sky-, night sky- or any other astrotourism-related experiences on the DMO's website. The only material mentioning a stargazing experience to be found on the DN's website, was the limited invitation to the guided stargazing tours, which were organised as a collaboration between our research team's member and the DMO itself (Figure 23) (Destination Nordvestkysten, 2023).



© Ruslan Merzlyakov Foto: Ruslan Merzlyakov

Stjernevandring

Nattehimlen i Thy er fyldt med vidunderligheder. Vidste du, at man kan se flere fascinerende himmelfænomener bare med det blotte øje? I påsken vil Ruslan Merzlyakov tage dig med på en eventyrlig oplevelse på det mørke og magiske Bulbjerg, hvor du kan komme tættere på stjernerne, lære om universet og opleve det fjerneste objekt på stjernehimlen, menneskeøjets kan se. Kender du måske kun Karlsvognen, og er nysgerrig på stjernehimlen, så kom med på stjernejagt på Bulbjerg. Turene er både for nysgerrige voksne og børn.

Ruslan Merzlyakov er passioneret jæger af de mest imponerende nattehimmelfænomener, og er blandt verdens bedste astrofotografer. Han vil tage dig med på en kort vandring i mørket mod stranden ved Bulbjerg. Vi ligger på skind/måtter, mens Ruslan fortæller om den imponerende stjernehimmel og viser bl.a. stjernebillederne med en laser pointer. Der vil være mulighed for at se det hele nærmere i et teleskop.

Der er mulighed for at få taget et gruppefoto under Mælkevejen.
Der tages forbehold for at turene aflyses i tilfælde af dårligt vejr.

Praktisk info:

Dato: den 6. + 7. + 8. april 2023 kl. 20.30

Varighed: ca. 2,5 time

Mødested: Parkeringspladsen ved Bulbjerg

Forudsætning: Vi går ad en trappe til stranden

Medbringes: Varmt tøj og evt. tæppe, lommelygte eller pandelampe

Tilmelding

Max 15 personer. Tilmelding her efter først til mølle princip:

Astrosafari 6/4: <https://visitnordvestkysten.nemtilmeld.dk/86/>

Astrosafari 7/4: <https://visitnordvestkysten.nemtilmeld.dk/87/>

Astrosafari 8/4: <https://visitnordvestkysten.nemtilmeld.dk/88/>

Figure 22. An invitation to stargazing tours by Destination Nordvestkysten during Easter (Appendix 5)

The growing interest in different phenomena that can be experienced under the night sky, focus on sustainable actions, and the upcoming Dark Sky Park in Bulbjerg are showing a clear direction towards initiating astrotourism-related activities as secondary experiences in the area, but astrotourism can become primary attraction once it proves to attract numerous visitors. Although at this point, the CEO of the organisation does not view astrotourism as an independent product, when Bulbjerg will achieve the certified title of an International Dark Sky Park, we can expect the area being marketed by the DMO. At the same time, based on the field observations of the successful stargazing tours, as a product within astrotourism as a genre, stargazing experiences would work as a perfect add-on to the outdoor element during low season (see “Astro Safari in Bulbjerg”).

Destination Limfjorden

The DMO of Destination Limfjorden (DL) represents tourism in three municipalities: Skive, Struer and Morsø. As it was published on the organisation's official website, the number of overnight stays has slightly increased during the pandemic (Destination Limfjorden, 2023). In the figure below we can also see the graph, showing that municipality of Struer is the least visited one among the three municipalities that make up DL (Figure 24):

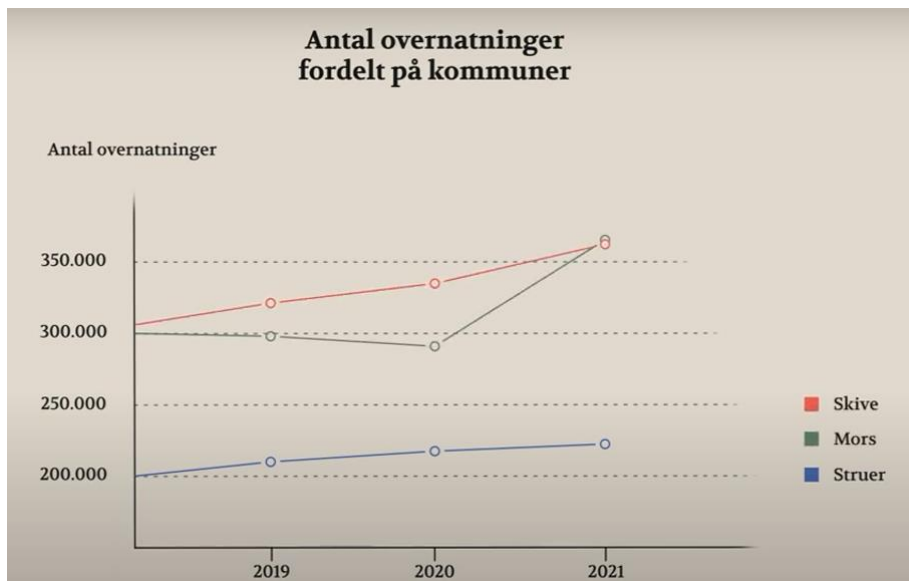


Figure 23. Number of overnight stays in Destination Limfjorden divided into the three municipalities (Destination Limfjorden, n.d.)

In 2022, DL has for the first time reached 1 million of total overnight stays, which is 23% more than in 2019 that was considered to be DMO's record year (Gregersen L. , 2023), although it is more than 6 times less the number of staying guests who visit DN. This behaviour of the guests' consumption can be caused by many elements, such as environment, location, offered experiences, offered accommodations and other attractions.

The strategic plan, published by the DMO, includes organisation's vision, which is described as creating a strong cohesion inward in the destination that later can become an influential force on the outside to attract more tourists to the destination. As elaborated further, this cohesion reflects on the collaboration between different tourism actors in order to create unique products/services and good experiences. Furthermore, it is important to create a bond between the visitors and this particular area in an authentic way through getting in touch with locals and experiencing the atmosphere of the place. Because of this mutual work, it is possible to build a united destination, where stakeholders feel like they are responsible for tourism in the area, and they want to develop it even

further. The aim of the organisation's current strategic plan is to present DL as an attractive and unique destination, which is characterised by the cliffs, child-friendly beaches, hiking trails and unique landscape that can offer tranquillity, authentic experiences and all-year around activities for everyone (Destination Limfjorden, 2021).

Until 2025, the DMO plans to build a strong collaboration with the local stakeholders and tourism actors in order to gain growth and develop an attractive destination for the visitors, who are primarily families with children and elderly couples with good economic background (Destination Limfjorden, 2021).

Like Destination Nordevstkysten, this DMO also sets five principles for the development:

1. Creating growth – developing different experience offers (products, services) by focusing on the market's needs. This can be done by sharing the knowledge, statistics done by professionals and analysing current trends.
2. Concentrating on developing a critical mass – since dependence on the high season strongly affects businesses in this region, it is crucial to create a critical mass, which ensures an economic stability for businesses.
3. Creating an all-year-round destination – the DMO plans to work actively together with the businesses, so the wide variety of activities and experiences would transform the seasonal destination into the place, which attracts tourists all year around. Based on the statistics of 2022, we can see there is a strong dependence on the high season, as number of guests experiences a drop down to 95% between winter and busy summer months (Figure 25).

Overnatninger efter kapacitet, gæstens nationalitet, område, overnatningsform, periode og tid

	2022
Alle typer overnatninger	
I alt	
Destination Limfjorden	
Alle typer	
Januar	11 336,00
Februar	28 483,00
Marts	27 372,00
April	88 595,00
Maj	103 975,00
Juni	125 024,00
Juli	272 809,00
August	163 173,00
September	83 911,00
Oktober	70 454,00
November	24 271,00
December	23 256,00

17-4-2023 Visitdenmark , © visitdenmark.statistikbank.dk/VDK1

Figure 24. Number of overnight stays in Destination Limfjorden in 2022 (Visit Denmark, n.d.)

4. Increasing accessibility/visibility – through marketing it is possible to share the story of the Limfjord, which can create more attention to the destination.
5. Thinking sustainably – sustainability (all three pillars: economic, environmental and social) plays an important role in the future development, which affects local stakeholders and businesses that are encouraged to incorporate this concept in their working mechanism.

Destination Limfjorden has developed a sustainability plan for the period until 2025, where the organisation aims to become Denmark's most sustainable destination. With the help of this strategy, the DMO works towards:

- Increasing the ability of the destination to attract tourists all year around
- Making businesses competitive and in long term more sustainable
- Offering more sustainable options when it comes to choosing this area (Destination Limfjorden, 2021).

DL tracks current trends and the organisation sets plans how to increase quality of products/services, making the experiences more visible to the visitors by developing the website of the destination. The DMO also focuses on three municipalities by using unique brand identities, which stories will help strengthening storytelling strategy of the DMO, but also differentiates the three municipalities accentuating the experiences one can have when visiting them:

- Morsø being the gastronomical destination, especially branded as the Shellfish Capital (*Skaldyrshovedstad*),
- Skive – the Pure Life (*Rent Liv*),
- and Struer – the City of Sound (*Lydens by*) (Destination Limfjorden, 2021).

The DMO emphasises its double-sided role as being an internal facilitator/manager and having marketing responsibilities aiming to strengthen destination's image. There are three areas of actions to focus on during this period until 2025: strengthening the relations, consistent guest service and increasing visibility on the platforms (Destination Limfjorden, 2021). As described earlier, we had a short conversation with the CEO of DL, Kristina Lehman Schjødt. She mentioned that DL is open for implementation of new experiences and cooperation with neighbouring DMOs, as long as it makes sense for tourists as well as stakeholders and it transmits similar values harmonising with the vision of the destination.

Recently, a large section communicating Dark Sky experiences in the area has been added to the DL's website. This brand-new initiative was realised in order to attract more tourists to the destination during the low season, which is actually the peak season of stargazing activities that last from August until May. The new webpage includes important information about where the best spots to experience night sky are located, a presentation of different phenomena (grouped-based on the season, when they can be experienced) and tips on when it's the best time to plan nightly adventures in the area (Destination Limfjorden, 2022). Despite Morsø being branded as the Shellfish Capital, it is presented as the core area for experiences in the darkness, since 5 out of 8 stargazing locations guide the reader to visit the island of Mors (DestinationLimfjorden, 2023). This matches the analysis of the project's focus area that demonstrated low level of light pollution. DL also is one of the few Danish DMOs, which has a section on their website dedicated specifically to promote stargazing in the area – others are Destination Sydkystdanmark (Destination Sydkystdanmark, n.d.), Destination Bornholm (Stefan, n.d.), Visit Samsø (VisitSamsø, 2020) and RebildPorten (RebildPorten, n.d.).

In conclusion, DL is open for new initiatives that can contribute to the growth of the destination, considering the three pillars of sustainable development. One of the main differences between Destination Limfjorden and Destination Nordvestkysten is the DMOs' openness towards working with astrotourism as a new sector within outdoor experiences. Although we haven't seen DN's updated development strategy, it appears that DL has more focus on sustainability that matches the main idea of astrotourism as a sustainable product. From the communication standpoint, DL is

already few steps ahead the neighbouring DMO, as it has a stargazing-dedicated section on the website, although there haven't been arranged any related activities yet.

Analysis of the interviews

The aim of conducting interviews firstly was to discover the process of sense-making of darkness and the narratives related to the phenomenon, but further on, the respondents were asked to talk about their previous experiences related to astrotourism, and their relation and view on the sustainable tourism development.

The respondents have been asked 13 questions about different topics:

- The first three questions were about the general information of the interviewees: their age, gender and place of residence. By knowing such facts and the answers on following questions, it helps the research to get differentiated opinions from a wide variety of age groups and genders. The geographical location of the respondents helps to localise the different views on the values of darkness and the perspectives on the effects of light pollution.
- The fourth and fifth questions were related to darkness, asking the interviewees about their feelings and emotions evoked by darkness and their fears related to this phenomenon.
- The sixth, seventh and twelfth questions focused primarily on the concept of astrotourism and the activities related to it.
- The questions nr. 8 and 9 were aimed to discover the domestic tourists' perspectives on light pollution and its effects on the planet and society.
- Another set of questions have been grouped around the concept of sustainable tourism in general and then the last question zoomed into Danish tourism development in context of sustainability and astrotourism.

Our research team used the thematic analysis method to get the information needed from the transcriptions of the interviews. This method helps to understand the process of sense-making and helps to explore the narratives about the different topics listed above. After gathering the stories (interviews), the next step was to become familiar with the transcripts and to look for the insights and meanings. This was followed by comparing and highlighting the differences of the

interpretations and finding the nuances between the different opinions of the respondents. The last step in this process is creating an understanding and connecting the novels in an insightful way.

Thematic analysis of the interviews

As presented earlier, the respondents were asked 13 questions of different topics. Further on, their answers are analysed using the thematic analysis as a method in order to find common patterns in the responses and also to highlight the nuances.

The first question was regarding the age of the respondents, which ranges between 25-67 years, meaning they belong to several age groups and might have different opinions on the subjects such as sustainability or light pollution, since these topics have been discussed more deeply just recently. It can be assumed that younger generation would have more focus on sustainability, although this was not the case and preserving dark skies as part of sustainable development was equally in focus through all age groups, as the analysis of the interviews demonstrates later.

The second question refers to the gender of the interviewees in order to reflect on the possible differences in the views between males and females. The proportion is 12 men to 5 women. This division is not intentional; we have selected the first 17 volunteers who were willing to participate in the interview after publishing an invitational post on two social media platforms (Facebook, Instagram).

The third question was about interviewees' place of residence. With the help of this question, we can observe if there is a difference between the people's perception about the natural dark sky or in the emotions that evoke based on where they live (big city, small village). As it showed, among the respondents, there are residents of Northern Germany, Aarhus, South Zealand, Central Jutland, Copenhagen and Northern Jutland.

The question nr. 4 and 5 referred to the topic about darkness and the respondents' perception of the phenomenon, as they were asked to describe their feelings towards darkness. Only one respondent has claimed that he had to cope with anxiety for several years for the past years in darkness, but he was able to fight it with the help of nature experiences during night-time hikes/overnight stays out in the wild in Vancouver:

“Darkness always has been a journey in which I have been scared for many years, due to different reasons, but I have learned to live with it thought as a peaceful element. There can still appear a bit of anxiety, especially in the areas which I am not familiar with. I have lived a couple of years in

Vancouver and have hiked/slept alone in the areas, where animals such as puma, black bears, grizzly bears and wolves can pay you a visit during the night-time” – own translation (Appendix 3, interviewee 17)

The respondents highlighted feelings regarding the inner peace such as: cosiness, calmness, freedom, curiosity- as one of them claims: “*astronomy is one of the sciences looking for answers*” (Appendix 3, Interviewee 6), silence and tranquillity. They claimed that darkness can be beautiful and “make the little things shine brighter” (“*...Og så synes jeg bare mørket er smukt, fordi de små ting lyser ekstra kraftigt der*” – original quote (Appendix 3, interviewee 4)). Others connect it with community-building experiences, while being a scout or spirituality and make the realisation of “being part of something magnificent in a huge universe”:

“*...og være en del af noget storartet i et kæmpe univers.*” (Appendix 3, interviewee 17).

Some feelings that can affect travel experience in a negative way were also expressed through the adjectives of uncertainty, fear, anxiety and being unfamiliar with the environment due to the missing of a primary sense – ability to see in darkness.

Despite our expectation of respondents living in big urban environments, such as Copenhagen, Aarhus or Aalborg, claiming that darkness could increase criminal rate, they did not connect it with unsafe environment (Figure 26) (Appendix 3).

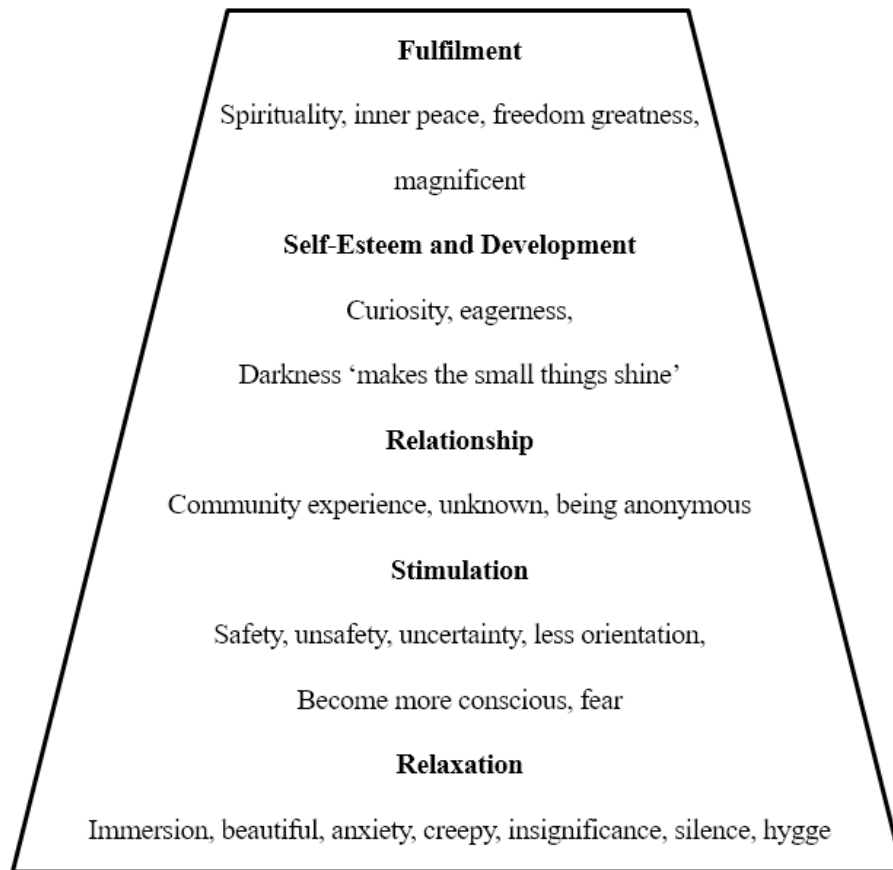


Figure 25. TCL model of interviewees' motivation factors.

Because the group of our respondents is being represented by the mix of men and women of different ages and them having different previous travel experiences, we can see that the TCL model is filled on every level. It is a temporary illustration of the interviewees' motivations and also the possible obstacles that keep them from experiencing astrotourism in natural darkness. But as the first example shows, it is possible to conquer the fear and enjoy the time in the nature after sunset.

As mentioned earlier the sixth, seventh and twelfth question focused on the concept of astrotourism. The sixth question was about the interviewees' previous knowledge or interest in astronomy. According to the interviews, all of our respondents have some kind of connection to the astrotourism on different levels – starting from a father going stargazing with his son “*together with my sons we have been hunting for Northern lights, comets and luminous night clouds*” (own translation (Appendix 3, interviewee 9)) to presence of an astrophysics student. As some interviewees claimed, they want to capture the wonderful phenomena they see, therefore many of them use cameras to photograph the night sky to keep it as a memory of the experienced phenomenon. For most of the interviewees, the interest in

astronomy started from having a childhood memory, which could have been an activity together with their parents or other children, but also it could have started after watching a cartoon (Lion King, Barbie) or a movie (Swan Lake) (Appendix 3, Interviewees 17, 4). One of the respondents is the administrator of a big group of Northern lights enthusiast on a social media, meaning he helps people to connect in the cyber sphere, where they are able to share their experiences:

“I have a very big Northern Lights-group, as I am interested in this phenomenon in the same way as in NLC” – own translation (Appendix 3, Interviewee 14)

Further on, the respondents have been asked if they ever travelled to a place, where stargazing, as an activity, was part of the trip. Nine interviewees responded that they had never planned a trip that included any stargazing activities. We can observe that many of them connect this experience/activity with the famous dark-sky destinations such as Iceland, Finland, Canary Islands, Peru, and they do not consider Denmark as a potential domestic destination to experience astronomy-related phenomena. One respondent even emphasised that they are not willing to pay an extra fee for a planned trip, if they can build it up by themselves:

“I can’t see the point to pay for something that I can arrange myself” – own translation (Appendix 3, interviewee 17)

The twelfth question is tightly connected to the seventh, as the interviewees were asked if they have heard about the dark sky/astronomical destinations in Denmark. The island of Møn was mentioned among most of the answers as a marketed dark-sky destination, which can be a result of being a certified Dark Sky Park in the IDA-programme since 2017. This proves that the programme is a great opportunity to become more visible for the ones who are interested in astrotourism and also to reach beyond the borders, since IDA is worldwide-known organisation. One of the respondents mentioned the stargazing activities in Bulbjerg, which were arranged between our group’s member and Destination Nordvestkysten, but also locations such as Wadden Sea, Mandø island, and several observatories were mentioned as well (Appendix 3, interviewees 1, 4, 7, 9, 15). On the other hand, some of the interviewees expressed their opinion about Thy having the potential to be marketed as a dark-sky destination in Denmark, because of its great characteristics:

“Many times, I have been wondering, why I haven’t heard about a phenomenon (Dark Sky) from Thy when I have studied a light pollution map and why does the region not focus on it. With all this wild nature, it seems to be an unreleased potential, which can challenge the area a bit more” – own translation (Appendix 3, Interviewee 17)

Since light pollution is a huge threat to the natural dark skies, we have asked the respondents if they have heard about the phenomenon and its negative impacts on the environment and society. All of our respondents were aware of light pollution and many of them expressed their worries on the problem. Some of them have taken some actions on a personal level to reduce the light pollution, for example by avoiding using light in the courtyard:

”No where we live, we don’t have any outdoor lighting in our courtyard, as we all feel safe and happy for darkness” – own translation (Appendix 3, interviewee 13)

Most of the interviewees shared how they already experienced the negative impacts of light pollution during their night walks/tours, because they were not able to see the stars while being outside. All the interviewees are aware of the difference between the ability to see the stars in the countryside or from the cities. One respondent had even expressed that she has a dream to live in a place with less light pollution: *“My dream is to live in a place with less light pollution than in Aarhus”* – own translation (Appendix 3, interviewee 4).

The ninth question referred to the effects of light pollution on the planet and the living species. The respondents have expressed that there are many negative effects of the improper use of light or too much artificial light. They mentioned different negative effects on different animal species, especially the ones that are active during night-time, but also our interviewees have expressed their anxiety regarding the effect on people’s circadian rhythm as well. Some of them mentioned the spiritual meaning of the stars in their answer and expressed that people associate stars with something beautiful and peaceful, which cannot be experienced because of lack of darkness:

”Moreover, there is a spiritual connection that we often connect stars with something that is beautiful and peaceful, which we cannot experience if it’s not actually dark at night” – own translation (Appendix 3, interviewee 5)

Another respondent highlighted the negative effects on astronomy, since light pollution has a huge impact on this field of science, because artificial light prevents researchers to make big progress in the learning of the universe. Moreover, some of the telescopes used on the ground cannot be used any longer because of the level of the light pollution:

”From my point of view, it is a huge problem. Light pollution prevents us from learning much more about the Universe, which can be a benefit for us all in connection with technological development, even though some people are not interested in the Universe. It requires telescope on Earth and many of them nowadays cannot be used because of light pollution” – own translation (Appendix 3, interviewee 12)

Though, some interviewees mentioned a positive side of the street lightning, which they have connected with the feeling of safety in big cities or remote areas that are considered less safe. But the majority of our interviewees still have expressed that there is a need from the political level to have some laws regulating the level of artificial lighting and the proper use of it.

The last theme that we touched during the interviews was sustainability. The respondents were asked if they think that light pollution should be handled more seriously and the reduction of it needs to be part of the sustainable development initiatives. Most of the respondents claimed that light pollution should be taken more seriously, and it is important to find ways to reduce it. They expressed that the change should come from higher political powers by introducing legislation on the level of emitted light and the way how it is used. Interviewees claimed that it depends on the region, where it is possible to have less streetlights, although according to some, there are some areas that might be dangerous to turn the streetlights off, because of the high criminal rate:

”I can imagine, there are some regions (large cities etc.), where it’s not possible, or where it doesn’t make sense. But there also are some regions, where it would be possible (and probably should) discuss whether it is really necessary to have lights throughout the entire night” – own translation (Appendix 3, interviewee 8).

There were two sceptical opinions on this issue – one highlighting that nature and dark sky can be experienced outside of the cities: *“the city should be the city, and nature can be experienced outside the city”* (own translation, Appendix 3, interviewee 10); and the other one was sceptical about the activities of the green parties claiming that they act against their mission: *“...It seems that those who shout the most about climate and sustainability are also those who burden the climate the most...”* (own translation, Appendix 3, interviewee 13).

Following the sustainable topic, the respondents have been asked to share their opinion on the concept of darkness in regards of sustainability. Among the answers were several definitions of sustainability, which in some cases followed by the explanation that our needs are satisfied by the high level of artificial light. But through this process, people might lose the natural dark sky and therefore future generations will not be able to go out stargazing or observing other natural dark sky phenomena. Most of the answers suggested finding a balance between light and darkness as it was during the last centuries by reducing the unnecessary use of electricity. Some of our interviewees have connected the loss of darkness with the biodiversity crisis and the disturbance of circadian rhythm. One of the respondents claimed

that nowadays sustainability is commoditised, because people are willing to pay more if a company claims that they have sustainable initiatives:

“...sustainability is really trending nowadays, not only because of people starting to realise that we are running short on resources, but because it has a price. It became more tangible in the past years and due to the war.” (Appendix 3, Interviewee 6)

Moreover, it is a trending password, which can attract a specific target group that wants to make a step ahead in protecting the planet. One of the interviewees was highlighting the environmental pillar of sustainability saying that if the concept is tied together with nature, then more people will be interested in achieving the goal. Another interviewee was talking about the trend of peoples’ hunger for more/faster/bigger things as the current business environment only is focused on growth:

”...it would be a part of solution to keep the balance in Earth’s climate, instead of imposing the Earth on our (humans’) infinite hunger for “more/bigger/faster”, which in current marketing economy is only connected to growth” – own translation (Appendix 3, interviewee 2).

The interviewee insisted instead to find a balance in order to protect our planet. The majority of the respondents expressed the need for using the electricity and fossil fuels more properly and responsibly to reduce the waste of energy.

The last question had a national angle and asked the respondents if Denmark should focus more on the sustainable development in tourism targeted towards the astrotourism initiatives. All the respondents agreed on that Denmark should focus on the sustainable growth of tourism sector. Most of them expressed that this “tiny country” has some great characteristics to become a dark sky destination. One of the respondents was sceptical in the case of international tourists, since they might choose a more popular destination such as the Canary Islands or Iceland, although in this project we are primary focusing on the domestic tourists.

”I don’t know how much astrotourism makes sense in Denmark. If it is to attract foreign tourists, I think those tourists would go elsewhere. Do you want to go to Denmark to see stars, or do you go to Iceland/Canary Islands? I know what I would have chosen” – own translation (Appendix 3, interviewee 5)

Many of the interviewees brought the example of hunting for the Northern Lights in late February and early Spring of 2023, when the whole Denmark was eager to experience the wonderful Aurora, but people have expressed the experience of lacking information about where they can see it and

when it can happen again. Therefore, education plays a crucial role in broadening people's knowledge in this field, and it can raise awareness on the fact that in Denmark it is also possible to experience similarly unique phenomenon as in Finland or Iceland. This is possible to achieve with the help of the local DMOs by communicating information about the opportunities that are laying in front of potential visitors and guests.

In conclusion, we can see that darkness is considered to be a natural phenomenon that needs to be protected and it can be perceived as a value through the night sky-related activities. Our respondents highlighted multiple roles of stargazing as an activity, such as community-building and family activities, but also a self-reflection and a peaceful state of mind. From the answers, we can conclude that light pollution has many different negative effects on personal, scientific and global levels. As the respondents expressed, the solution lies in the hands of politicians and there is a need for legislation in order to decrease the growing level of light pollution. Based on the recent hype-phenomenon, which occurred around the hunt for Northern Lights earlier this year and based on the responses from the interviews, we can see that there are several unsatisfied needs which argue for the need of introduction of astrotourism in Denmark and the chosen area has the full potential to build a strong profile in this type of tourism.

Astro Safari in Bulbjerg

As mentioned earlier, one of the primary data collection methods happened in connection to the guided stargazing tours organised together with Destination Nordvestkysten. Data collection was not the main purpose of the events, but the timing matched our work with the research project. This allowed our team to gather additional data by observing guests in the real-case scenario since the tours were organised as a “real” experience. In total, there were three guided tours under the night sky and the event was called “*Astro Safari – Star-hunt in Bulbjerg*” (own translation (VisitNordvestkysten, 2023)).

By the fact that guided tours under the night sky can be seen as a unique experience (because of their rare appearance) in Denmark, it was necessary to write an inspirational description of the offered experience. Together with the beautiful photograph, the tours' description tried to capture all the elements that guests could experience, without promising too much. The events were presented to the guests as a combination of all four experience realms, which are described in Pine and Gilmore's experience economy theory. The guests were promised to learn about space through interesting facts and stories (education, entertainment), see

different objects through the telescope (aesthetics) and hike in total darkness without using any light sources (escapism). Although, it was not possible to have an interview with the guests after the tours to investigate whether the promised experience realms were achieved by each individual. Despite this fact, stargazing and nature can be classified as an aesthetic realm, while the guided element itself appeared as knowledge-sharing. At the same time, the educational element of the tours was accompanied by some jokes/funny stories about night sky, but it is challenging to make a conclusion whether guests felt being entertained. Since all three tours were free of charge and each tour tried to capture as many experience realms as possible, it can be assumed that Astro Safari was perceived as the most valuable transition from a raw material (darkness/night sky) to an experience, from the perspective of a tourism experience product. Increasing the income is the main point of experience economy, but in the case of Astro Safari, DN focused on the other benefit of the arranged tours, which was great satisfaction and memorability among guests (VERDE Ltda., 2022, pp. 16-17).

Because such an activity is highly dependent on weather conditions, the participants were warned that tours could be cancelled, if the conditions would not be suitable for this experience under the night sky.

As it showed, the events had an extremely high demand, since all 45 places were booked within the first couple of days after the announcement of Astro Safari. Destination Nordvestkysten wanted to make all the Easter experiences free, but it was necessary to reserve a spot. Because the events were free of charge, it cannot be concluded whether such an initiative has a potential for economic contribution to the area and economic growth of astrotourism – although, it was clearly noticeable that many people had interest in the opportunity of experiencing the night sky since the places were booked without any paid marketing. In the feedback e-mail from DN it was stated that the organisation has experienced “*huge gratitude, excitement and happiness*” (Figure 27). Additionally, it was mentioned that there were many guests both from the local area but also from the outside, meaning that night sky with its unique characteristics had a potential to attract people with different geographical background. Especially, because of nearly missing marketing of the events, it can be said that the experience product itself was able to attract attention, which in the future can be used as a strong element of place branding. The success of the events also is a strong argument for implementing the concept of astrotourism experience in the destination’s tourism development strategies.

Kære Ruslan

Først og fremmest vil jeg gerne sige 1000 tak for en fantastisk påske i Thy med EvenTHYrlige Naturoplevelser.

Vi er så stolte af det, vi har lavet sammen med jer. Der er kommet gæster fra nær og fjern, som har troet de kendte Thy og dens forskelligartet natur. Men de er blevet overrasket over de mange oplevelser, som vi har strikket sammen.

Vi har oplevet en stor taknemmelighed, begejstring og glæde.

TAK fordi I har været med til at skabe dette 😊

Figure 26. E-mail feedback from Destination Nordvestkysten after arranged guided tours

Because an astrotourism product can include several elements of the experience realms, it was expected to see guests representing a wide range of several age groups. As the field observation showed, in total 8 children and 37 adults attended the arranged activities, where the age gap between the youngest and the oldest participant was approximately 70 years. Each guided tour was planned to vary approximately 2,5 hours – from 20:30 till 23:00 local time, which for some might had seem to be late since the majority of guests were represented by adults. Although, it is possible to assume that adults were the ones who saw information about Astro Safari on the internet or social media, so we expect that adults were in charge of decision-making. If stargazing tours were advertised physically (e.g., banners, posters etc.) in the areas with a high concentration of visitors (both local and national), it would be possible to see a different age spread of the guests. Visual marketing of the tours in the physical world could also have contributed to the brand image of Thy and DN as an Astro destination, although that was not the chosen case. By dividing guests into groups, we can see following types (Figure 28):

Solo	Family (at least one adult and one child)	Couple	Group of friends
3	6	8	2

Figure 27. Division of 45 guests into groups (Appendix 1)

As the figure shows, the case of guided stargazing tours as an astrotourism product was mostly popular among families and couples, although there still was presence of three solo guests and two groups of friends. Couples were represented by the different age groups, both youth and seniors – which makes it possible to interpret as a wish to obtain a romantic experience together. Many people still consider stargazing to be a romantic activity, as the night sky is filled with stories, but also 82% of women consider stargazing to be one of the most romantic date nights (Outdoors Happy, n.d.). For families, the push factor could have

been the children's curiosity of the night sky and wish to learn more about space with the help of a guide – exactly what DN promised in the description of the experience.

Because it was unknown how much knowledge of the night sky did each guest have, it is not possible to classify them by the interest type. Though, based on the comments that were mentioned during the three guided tours it was possible to define three main drivers for choosing stargazing tours:

1. Curiosity about space
2. Wish to try a unique experience
3. Interest in the night sky from the photographic standpoint.

As guests had different backgrounds and interests, it was chosen not to ask complicated questions, rather questions that are considered to have commonly known answers. For instance, when the guests were asked to point at the part of the sky, where asterism of Big Dipper can be found, not everyone was able to do so. This means, even though a person might be interested in space or stargazing, they might not have the knowledge of it. To keep everyone engaged, each guided tour started with the short presentation about the world we live in, and later knowledge-sharing was combined with stargazing through the telescope. Pointing at different objects in the sky and telling facts about them happened with the help of a green laser pointer, which kept everyone's focus since the guests knew exactly where to look and not to confuse one star-looking object with another. Both the laser pointer and the telescope served as crucial tools in order to provide a more valuable experience for the guests. E.g., without letting guests to look at different objects through the telescope, the time of each guided tours would be significantly shorter and would only differ from stargazing on-the-own-hand by the included service of knowledge-sharing. It was easy to notice how excited the guests were, when they got an opportunity to look at different objects through the telescope. Among the shared feelings, the used words were such as “Wow”, “Amazing” and “Look, how many stars there are!”, which could be a sign of achieving an aesthetic experience. As the presented earlier in this chapter, the excitement was also noticed by the organisers themselves, which was mentioned in the e-mail feedback (Figure 27).

During all three tours, clouds were covering large portions of the night sky, but every guest stayed till the end of each guided tour, which could be translated into the fact that guests also were enjoying the dark environment or wanted to get all the offered knowledge about space.

During small breaks, some guests even asked question about different topics, which only added to the fact proving their curiosity to learn more.

As it was mentioned earlier, each tour ended with a short hike from top of Bulbjerg down to the beach without using any sources of light. It was decided to do so that everyone would have enough time to have their vision adapted to darkness from the beginning of each tour – this was important, because the previous analysis showed that area around Bulbjerg has darkness of the highest class. None of the guests was against such an experience, even though nobody has ever tried hiking in total darkness without using any light sources. The guests were even cheering each other and sharing funny stories from their previous experiences being in a dark environment, which was seen as the perfect example of experience co-creation.

To create value for the guests, the aim of Astro Safari was to deliver intellectual elements of novelty, excitement and challenges as the highest level of Maslow's hierarchy of needs. Although, there was also presence of basic needs (guests were offered a warm blanket and tours were arranged as a social gathering), those were not functioning as the main attraction elements. The experience focused mostly on delivering knowledge with the help of tools out in the nature, which functioned as a stage. Delivery of knowledge alone can be considered as a service but as following Pine and Gilmore, by combining it with other elements and presenting it as a staged experience, Astro Safari can be considered as a differentiated premium on the progression of economic value.

In conclusion, the real-life case of an astrotourism product demonstrated a total success, as all three guided tours under the stars were fully booked within the first couple of days after the launch. With almost no advertisement (neither paid digital ads or physical advertisement), the experience product of Astro Safari can be used to attract visitors, if the DMO reviews its vision on astrotourism. According to any business development plan, a product must be in the top priority before getting to branding and marketing – and as the analysis of the guided tours showed, there are many strong elements that turned Astro Safari into a quality experience product that can become part of the area's place branding. Although it might be difficult to make a conclusion whether such a product could be economically beneficial for the area's tourism development, it still attracted a diverse range of guests. In that particular time of the year, when it gets dark late, we saw majority of guests being represented by adults but presence of families with children showed that it also is possible to include this target group

into the future development. Although guests had different pull factors for choosing the experience and different levels of knowledge about the night sky, everybody was engaged throughout the entire time of each guided tour. Especially the presence of many experience elements, which aimed to deliver all four experience realms, provided guests with excitement, knowledge and gratitude of the arranged tours under the night sky.

Development of North-western Jutland using concepts of astrotourism

As the conclusion of a previous chapters showed, the constructed reality that is based on the analysis of the 17 interviews views darkness as an important element, which adds to the quality of human life and environment. At the same time, field observations of the three guided stargazing tours in Bulbjerg, which were arranged by Destination Nordvestkysten, demonstrated a huge success of realisation of this unique experience. Following the need for season expansion, sustainable development and need for offering new experiences – darkness, as the key element of astrotourism and a valuable resource, has all the potential to be used for realisation of the goals.

Creating value with darkness to attract tourists

The term “value” is subjective, as it can be interpreted from multiple perspectives, depending on the context and the sender. In the case of this project, we aimed to research a constructed understanding of darkness as a phenomenon, which showed to have many positive interpretations. Following the logical thread, if a company (in our case – a DMO) would include darkness in their brand identity by working with astrotourism on a local and regional scale, it would match the needs of potential guests.

One of the current main issues in tourism in the region of North-western Denmark is the dependence on seasonality that takes place during summer months, when people travel to Denmark, but also the domestic tourism is more accentuated. There are several issues that can explain such behaviour of tourists among which could be closed campsites (since typical camping season lasts from March until September/October (Milbæk, 2022)), resulting in a much smaller capacity of staying guests and lack of activities. The so-called dark-sky season, when it is possible to experience dark skies and other night-sky phenomena in Denmark, lasts from August until early May (Camp Møns Klint, 2019). In June and July, when the

concentration of tourists is at its highest, the night sky is too bright, as the sun doesn't set low under the horizon (Schroeder, n.d.). This means, that shoulder and low seasons are the best for stargazing since the sky gets darker throughout Autumn – where astrotourism can help to achieve deseasonalisation in North-western Jutland.

The analysis of the interviews showed that people are lacking knowledge about night sky as part of nature experiences in Denmark. Delivering knowledge and information about available experiences are some of the key tasks of any DMO, this is why there is a need for creating a communication plan emphasising the extraordinary dark environment in the selected region. As mentioned earlier, Destination Limfjorden already has a relatively large section that communicates stargazing experiences, as the only DMO in Jutland – but when comparing the scales of DL and DN, Destination Limfjorden doesn't have as much activity on their website as the neighbouring organisation. Considering complexity of the night sky and the different phenomena that can be experienced, a communication product must include a more detailed guide that would provide potential tourists with all the needed information. Such complex knowledge about the details of the dark-sky environment might not be handled alone by the DMOs' employees. Although the upcoming Dark Sky Bulbjerg might require Destination Nordvestkysten to work on communicating the night sky on their website, following to the interview with Peter Krusborg (Appendix 2), the organisation does not see as much value in darkness as our 17 interviewees. This is why, a possible solution to such a demand would be creating a specific theme-related internet-platform, where both DMOs will be presented as a united stargazing destination. At the same time, by hiring an experienced and professional person with knowledge about the night sky, who also could play a role as an influencer, would provide potential guests with the needed information and be in charge of updating the new website with the most relevant details about what is happening in the night sky.

Although La Palma and Iceland being the best and the most leading examples of astrotourism-dedicated destinations, it is also possible to use darkness as a resource to attract national and other tourists from the neighbouring countries (especially Germany) to visit North-west Jutland. In some countries that practice astrotourism, among which are the Nordics, many businesses offer their guests a stay in the unique glass-igloos, where it is possible to watch Northern Lights right from the bed of the accommodation (50 Degrees North, n.d.). Because areas around the Arctic Circle are the most suitable for experiencing Aurora Borealis (Northern Lights), the large capacity of arriving tourists during the dark,

winter, season has led to creation of many hotspots with own resorts, which focus on the Aurora-experience as one of the phenomena that can be found in dark environment.

It may require a huge investment for building new types of accommodation that focus on experiencing darkness, but besides economical resources it also takes time to research the area, whether it can be approved for expansion of infrastructure. As mentioned earlier, National Park Thy covers a large area in the selected region, but the land is protected by the Danish Nature Agency, meaning nearly nothing can be built according to the law – e.g., even renewal of the existing forest shelters only can happen following the specific styling, use of building materials etc. (Appendix 4). Though, both DMOs cooperate with the local businesses and stakeholders, meaning there are other opportunities that can be used on private land. Currently, in entire Denmark there are only two accommodations that offer sleeping with the direct view of stars – stargazing shelters at the Brorfelde Observatory's site on Zealand (Observatoriet, n.d.) and Glass Cabins on Lolland (Glashytterne på Lolland, n.d.). Despite this fact, it is not possible to conclude that these two businesses are the main competitors on the market within astrotourism, as unique accommodation opportunities depend on facts, such as location, environment and quality of darkness. As the analysis of the light pollution map showed, Zealand doesn't have the same quality of the night sky, as in our selected region, therefore it is possible to communicate the unique opportunity of staying under the wonderful dark sky conditions even without investing in building of new accommodations. But in the future, if other competitors will enter the market, the strategy must be revised. The islands of Møn and Nyord, which are part of the Scandinavia's first Dark Sky Park, have used the term "dark sky accommodation" since 2017, where the unique selling point focused only on the suitable environment for stargazing because of the high-end quality of darkness (Dark Sky Park Møn, n.d.). With the places being supportive to preserve darkness by using the correct lighting and communicating the importance of dark-sky conditions, the accommodations in North-west Jutland take inspiration from Møn as an example and use darkness as a resource to attract tourists – even without applying major changes to an existing product.

In addition to accommodations, which provide guests only with an experience on their own, there must be additional products that use the full potential of darkness as a resource by transforming it into a value following the model of Pine & Gilmore's experience economy. Assuming the fact that not every guest might want to pay for an accommodation (e.g., if one visits the area from a neighbouring city or region) and considering that local people might

also want to experience dark sky by gaining new knowledge and fulfilling other needs, guided services can play an important role in attracting people during the low season. As the field observations showed, Astro Safari tours in Bulbjerg were fully booked, meaning that people had interest in such a unique activity, especially because it was the only experience product offered after the sunset. Like the Dark Sky accommodations, it is possible to book and attend different guided tours to enjoy stargazing on Møn. Similarly, Mandø, Brorfelde Observatory and Ole Rømers Observatory offer guided tours under the night sky and the islands of Læsø, Fanø, Samsø and Langeland even arrange a weekend-event “*Lys i mørket*” (Light in the darkness – own translation), where guests can experience starlight with a guide (VisitLæsø, 2022).

Though, an experience can consist of several elements and value that is being offered to the guests can depend on the environment, programme and the guide self. Packaged tours, as the greatest example of tourism, still exists in the modern age of travelling despite seeing many people exploring the world on their own (Reali, n.d.). It is exactly the dynamics of the offered products or services that shape the value of an experience and create competition with the other businesses and tour providers. By including elements, such as offering a hot drink or a meal during the stargazing tours, giving guests an opportunity to see objects in the night sky through a telescope and capturing them under the stars creates a dynamic programme, which can be placed in the upper end of experience economy. The current state of market has shifted the behaviour of businesses from delivering exclusive products to being inclusive, which also can be translated as customers not willing to pay for several products that in reality can be connected (Truelson, 2018). That is why it is important to offer a dynamic experience to create the differentiation by offering a more valuable experience product than competitors.

There are many other innovative ideas that can be used in order to create value while including the darkness and natural dark sky with the help of guests, although communication and experiences are the most crucial elements in the case of selected region. By communicating darkness and the phenomena in the night sky, it is possible to create awareness of winter as the best season for stargazing, and by offering experiences in the physical settings, it will create an even stronger pull factor. In conclusion, looking at the examples from other destinations and reflecting on the success of the completed Astro Safari tours in Bulbjerg, Destination Nordvestkysten and Destination Limfjorden should take actions and use darkness as a development resource, as demand is there.

Place branding

Place branding, as claimed earlier, plays a crucial role in the marketing strategy of any destination, since there is a strong competition for resources such as human, cultural, financial etc.

According to Ashworth et.al. (2014, s. 5), the brand of a place can be constructed with the help of four elements: promotional tactics and identity claims, associations with place-making elements, narratives or “place stories” and interactive formations. These elements will be presented as a solution to the case of introduction of astrotourism in the North-western part of Denmark and branding the dark sky related activities in the area.

1. Promotional tactics and identity claims

Brand identity is a visible element of the brands, such as colours used on the webpage, logos and design that distinguish it in the minds of visitors or customers. When astrotourism-related experiences will be part of each of the two DMOs’ websites, it is important to fit into their vision and values since they have to follow a corporate design. As in the case of Astro Safari in Bulbjerg, it was published on Facebook and on the website of the local DMO – accompanied by a beautiful photo taken by the guide of the tours and the photographer, Ruslan Merzlyakov (Appendix 5). The photo gave a nice overview what the participants would experience, when attending one of the tours and it also served as a motivator to participate. The design of the event matched with the outlook of the website and shared similar values the DMO is working along.

As Ashworth (2014) claims, this element in branding also refers to the brand identity built through the communication by stakeholders primarily by the local DMO. In our case there are two DMOs, which cover the selected area, and one of them has already launched an experience related to astrotourism (Astro Safari) as it was mentioned earlier, but it was only possible to attend during Easter holidays. The event was described as a magical adventure, where the participants could get closer to the stars, learn about the Universe and experience the most distant object in the sky that a human eye can see (Appendix 5). It was promoted as a one-of-a-kind experience, communicated to everyone without setting the target group, inviting people to get closer to nature after the sunset to explore natural dark sky-environment by using darkness as a resource and focusing on its positive effects. This activity portrayed Bulbjerg, which is already a popular natural attraction, from another side and promoted the place as a great stargazing spot.

Our chosen area hosts multiple well-established tourist destinations and brands such as Nationalpark Thy, Bulbjerg Bird Mountain and Bunker (Bulbjerg Fuglefjeld og Bunker) and Cold Hawaii. In order to establish a well-known astro-destination in the area, it can be beneficial to have a meaningful collaboration with the associations responsible for these attractions.

The biggest attraction in the area is the Nationalpark Thy, which is Denmark's first national park. The newly built National Park Visitor Centre in Nørre Vorupøre, ended the year of 2022 with a huge success in the number of visitors outreaching the expectations, since the visitor centre reached 100.000 visitors (Thy, 2022). The park, besides the outstanding nature also has a historical importance since several Bronze Age Burials were found here and many German bunkers are placed along the coastline from the WWII (Nordvestkysten, Nationalpark Thy, n.d.). In the case of astrotourism, the national park can provide stargazing tours with great settings and an excellent quality of natural dark sky, without disturbing flora and fauna in the protected area. Since the place is popular among tourists, it is possible to attract the ones who already visited the park before by adding astro activities to the offer – therefore, they will be given a reason to come back again to experience the place from a whole new perspective.

As presented earlier, there are already initiatives towards Bulbjerg being an astro-destination by hosting the Star Hunt activity, which only can add the value to the area by fulfilling the Pine & Gilmore's model of economic value after receiving the Dark Sky Park certificate. This certification will put Bulbjerg on the global map of Dark Sky Parks in the IDA-programme and bring international acknowledgement of the place. The environment adds to the experience by getting closer to nature and connecting history of the place with the future development. Building on the success of the event series during Easter holidays, it is possible to develop new initiatives for the ones interested in astronomy or the eager tourists who want to try out something extraordinary during their vacation in North-West Denmark.

Cold Hawaii stands for 31 marked surf spots in Thy, which over time became a very decisive brand in the area. The name comes from the phenomenon of similar wind conditions as in the tropical paradise. Taking advantage of the outstanding aptitudes from 2010, when the small surf colony in Thy hosted Cold Hawaii PWA World Cup with the best surfers in the world and it continues to be the host of this remarkable event (Cold Hawaii, n.d.). This adds a valuable international attention to this tiny place by attracting surfers and their companion from the whole world. The brand of Cold Hawaii not only attracts international attention, but also on a national level it is a huge attraction inviting many Danes to the area. The unique environment sets this place in spotlight, which can also be beneficial for promoting

astronomy-related initiatives and tourism in this area. At the same time Cold Hawaii is not just for professional surfers, as they welcome amateur water sports fans and also first timers to experience an unforgettable activity by the coast. This niche destination-branding strategy succeeded in attracting attention of national and international media, but also many young people who decided to move to this area, because of the opportunities. According to the literature, gen Z is considered to be a pro-sustainability generation for whom it is important to make sustainable choices even during the vacation. They are the first generation born within the technology; therefore, they have easy access to information, and they use it with confidence. Moreover, their communication network is also influenced by the technological development, and social media platforms play an important role in their daily life (Çalışkan, 2021). With this in mind, it is crucial to promote astrotourism and build an eye-catching website where this generation can find valuable information about the experiences and the initiatives towards reducing light pollution as a step towards a more sustainable way of traveling and living. In collaboration with Cold Hawaii, it is possible to attract a younger generation of nature- and wave-lovers, who can also become ambassadors for the activities under the night sky. In 2021-2022 VisitDenmark had a winter campaign, promoting the country as a place to experience “Winter Wonderland”, where surfing in Klitmøller was presented as one of three “everyday wonder”-activities (Liberto, 2021). Along with surfing, astrotourism was the second unique attraction that shaped campaign’s branding of Denmark as a winter destination, meaning there can be seen a tight connection between these two activities out in the nature that can help attracting guests to the area.

2. Associations with place-making elements

In this phase of place branding, the focus is set on complex processes of creating a bond between the place and the brand.

From the interviews we found out that darkness and dark sky has a positive connotation for most of the respondents. They associate it with childhood memories, community-building and even spirituality. Dark environment offers silence, tranquillity, freedom and cosiness, which are emotions that connect the participants with darkness as a brand (Appendix 3).

As a unique selling point of stargazing activities, a participant might experience all four realms of experience economy. An activity in a dark environment can have a strong educational side, since the guide is providing facts and also interesting stories related to the night sky in an entertaining way, while the participants are able to see different objects through the telescope (aesthetic) and a hike in the darkness can add to the escapism realm.

Because most of the nature tours take place during daytime, we can highlight the timeframe of stargazing and astro tours as a unique selling point, as they only can be arranged during night-time giving a whole new view even on the familiar environment that people are used to experience in daylight.

As it was concluded earlier, the area has an exceptional quality of the dark skies, which is extremely rare nowadays, because of the high level of light pollution. By introducing astrotourism in the area, it is possible to educate people on the negative impact of artificial light on nature, but also encourage them to take steps towards reduction of light pollution on the personal level. Through stargazing tours and other activities in the dark environment, it is possible to show value of darkness by experiencing the magnificent phenomena during night-time.

3. Narratives or “place stories”

In this phase, all the possible narratives about the brand can be collected and the word of mouth (WOM) marketing has an important role, which is slightly uncontrollable, but it is a trustworthy form of marketing from the visitors' side. To get the most out of WOM, it is possible to encourage participants of astro-related activities to share their stories and experiences on different social media platforms. Moreover, creating a unique hashtag or tagging the organisation in the photos, shared by the participants, also is a great way getting feedback from them and encouraging their acquaintance to try out this unique experience or simply to visit the destination.

Another tactic that is commonly used is organising a competition around the events on social media platforms for example: a photography contest, where the photo that gets the most likes will win a private guided tour under the night sky or another prize, which focuses on the dark-sky values of the destination. The so-called “like and share” competitions also are a great way to reach a broader audience and create activity on the social media platforms of the destination's internet profiles.

Getting in contact with the local astro enthusiasts and asking them to talk about their experiences and to share a story of their connection with the dark sky can be a way to get more educational and entertaining content on the platforms.

Short videos, reels are really popular on Instagram and Tik Tok, since they work as an entertaining and stimulating advertisement by using creative tools (filters, voice-over, text), which currently is a winning strategy to get attention from the outside. Following some trends that are relevant can make the account visible for many users.

Creating meaningful collaborations with influencers, who are willing to promote astro-related activities in the area, can have a strong influence on different target groups, based on the follower group of the influencer. Influencer marketing is an effective way to reach a broader audience, since their follower group views them as trustworthy experts in their field and can have a decisive impact on their follower base's decision making processes. Micro-influencers, even though they have fewer followers, can create a bigger impact, since they transmit authenticity, relatability and more credibility than the ones with a huge follower base (Santora, 2023).

4. Interactive formations

In this phase we are focusing on community-building and social interactions. As mentioned in the analysis of the interviews, it is possible to create an online community around the theme of astrotourism. Different social media platforms offer possibilities to create a group for and of the people, who are interested in this subject and want to share their experiences with others. The group can also function as a brainstorm hub for future activities which have the value of darkness in focus. An upcoming offer (or a new experience) can be built upon the interactions with the former participants or local astro enthusiasts, who can share their desires and needs.

But not only an online community can be built on the shared interest; it is also possible to initiate physical gatherings and meetings for the ones interested in this subject. If there is a chance for some exceptional phenomena, it is a good idea to arrange a planned tour to experience it together with other people to strengthen the community spirit.

To conclude what has been discussed earlier, there are four elements that need to be revised by the DMOs of the selected area in order to build a brand with the help of astrotourism that would contribute to tourism development in North-western Jutland. The first is the identity of the brand and promotional tactics, which refer to visual representation of the new initiative to get tourists' attention and it also covers collaborations with the local stakeholders to offer extraordinary experiences. The second element is the associations with the place-making elements including relationship of the place with the visitors by invoking emotions in them. In this part two USPs were mentioned: the ability of an experience to contain elements from all four realms of experience economy and the unusual timing of the tours, which offers a new dimension to the place where tours will be organised. The third element is the narratives (place stories) in which attention is focused on the statements, people have on the new

initiative. The followers on different social media platforms can be motivated to share their experiences by announcing e.g., a competition. Collaborations with experts or influencers in this field can provide with more activity on the webpage and they also can have an impact on the consumers' decision-making processes. The last element discussed were the interactive formations, namely building a community of night-sky enthusiasts. With the help of the online sphere, it is possible to gather people from different parts of the country by creating groups on different social media platforms. On the other hand, physical meetings can also be arranged to create good experiences together with people who have the same interest.

Marketing

To fulfil the proposing solution for tourism development in North-western Jutland with the help of astrotourism to Destination Nordvestkysten and Destination Limfjorden, we must go through the last step, which is considering a marketing strategy. As mentioned in the theory section, a marketing strategy can be created with the help of 4P's, which is marketing mix consisting of four dynamic elements that are the product, price, place and promotion. By analysing each element, it is possible to get an insight into the specific strategy, the DMOs must create focusing on the strongest and unique selling points within astrotourism.

Product

Following the analysis of the light pollution map and conducted interviews, darkness appears as the main astrotourism product in the selected area that can be focused on to draw attention and attract guests. It consists of several elements and different phenomena that people can experience on their own, but there must also be offered other experiences, which would help to differentiate the region from other competitors on the Danish tourism market, who also integrate night sky as an attraction. Other experiences that would use darkness as a resource, would be considered as sub-products and such include guided tours, workshops, communication products, themed accommodations, visitor centres etc.

As per second quarter of 2023, Møn with its Dark Sky Park keeps the leading position within astrotourism in Denmark. Considering WOM, as the interviews showed, most people connect dark skies and stargazing with this island found in Southern Zealand (Appendix 3). To achieve the same

effect, there must be other sub-products that can strengthen reasons to visit North-western Jutland to experience darkness – like many people travel to Møn to see the stars.

The correct and widespread communication of what, where and when can be experienced in the night sky should be one of the crucial sub-products in order to provide potential guests with the most important information. As mentioned earlier, Destination Limfjorden as one of the few DMOs, already has a section on their website presenting nightly experiences in the local area. With the upcoming Dark Sky Park Bulbjerg, which is located within Destination Nordvestkysten's borders, the DMO should already prepare communication products, presenting and marketing darkness as a unique experience. Besides, to strengthen brand identity and create connection between the place and the guest, there should be created some physical evidence, such as tourist brochures, a Dark Sky map, postcards etc. that a guest can bring home as a memory of the place.

With the investment and DMOs' ability to guide stakeholder, it is also possible to incorporate dark sky into the accommodation offers as a themed element within darkness as the main product. Like on Møn, offering a dark-sky experience may be combined with an included guided tour or a stargazing session in the backyard of an accommodation, which will add value to the guests' overall experience. With time and rise of the competition within tourism industries in Denmark, there must be made investments into building unique types of accommodation, which would differentiate from the existing similar offers.

In the case of this thesis, the last sub-product suggestion was already tested by our team, which was a guided tour by the Bulbjerg cliff that was attended by 45 people in total. Stargazing with a guide can be considered as the main attraction that uses darkness as a primary resource, which can attract lots of attention. As seen from the example of the Star Hunting event in Bulbjerg there is a need for this kind of activity and the tourists are keen to experience astrotourism – especially, since all available tickets were “sold out” with almost no advertisement of the event. The offered experience product during Easter holidays can be developed even further by adding elements to create a bigger experience value. For example, many tour operators on the Canary Islands offer packaged evening tours such as “Champagne and stars” or “Dine and stargazing” (Spain, n.d.), which can be considered as the highest economic value in the chain of experience economy. By offering a cosy dinner before the tour in order to get to know the guide and also the participants, it will create a more luxurious and differentiated experience from other Danish astro-competitors. This will also be beneficial for the local food providing units, as it could be done in cooperation with the stakeholders and gastronomy businesses in the area. Moreover, it is possible to create even more personalised

and customised tours for couples, families, group of friends or even business teams who want to experience stargazing in a private atmosphere.

Price

The price always depends on the product, its quality, included elements, uniqueness etc. In the case of the communication products that present night sky and available experiences must be free, as they can be seen as part of the marketing addressed the consumers to motivate them to visit the area. Although, as soon as a product includes any kind of services, it should be considered as a paid product, because of the higher value of product's content.

For example, guided tours are a great example for setting a price of an experience product. As it was claimed earlier, the tours arranged in Bulbjerg were free of charge during limited period, but if the DMOs want to continue attracting people to the area by arranging more tours under the night sky, it is necessary to set a price on the offered experience. Based on the tour providers who offer guided stargazing in Denmark, the price varies from being a free experience on a special occasion (VisitLæsø, 2022), but in general the price range starts at 249 DKK (Sørensen, 2020) and goes up to 3750 DKK (Bipak, n.d.) pr. session. Considering the unique settings of any stargazing tour, the inclusion of multiple experience realms and the experience being offered after the sunset, it allows to set price slightly higher than a regular outdoor experience that takes place during daytime. By adding elements such as drinks and snacks offered during the tour, a personal portrait under the Milky Way, transportation in a vehicle to create a safari-like experience etc. will only add to the experience product's value, which allows controlling the price. At the same time, by having a well-known person (influencer or advocate) to guide the guests will draw attention and a more frequent request of the experience product. It is also possible to control the price by including/excluding elements, offering private or customised tours, but it is also important to keep an eye on the competitors and their price offering based on the product and its quality. As claimed earlier letting the participants customise the tours is a necessity in today's experience lead economy.

Place

In the case of stargazing and experiences in darkness, the selected region offers many dark-sky areas, where there can be organised tours, workshops and accommodations. With the help of a deeper analysis of the light pollution map and satellite images of the geographical location, it is possible to define the most suitable, and at the same time, interesting settings for establishing a

relevant product. As mentioned earlier, Destination Limfjorden already has pointed out 8 spots, from which five to be found on the island of Mors, which are perfect to visit to get a stargazing experience surrounded by a beautiful landscape scenery. The same list should be made for Thy, where the National Park would be in focus, following the laws and regulations in this protected area. The contrasting nature in the selected region and lack of light pollution gives opportunity for creation of several interesting stargazing spots, which one might spend days and nights to explore and experience – which is the main goal of tourism development.

Promotion

Considering promotion, it is possible to use both offline and online ways of communicating darkness to get the message to a broader audience.

As offline promotion it is possible to give out brochures and other physical communication products at the different tourist attractions and areas with a high concentration of guests in the region. Such places are cafés/restaurants, shops and accommodations, especially – campsites, so the guests will know that it is also possible to experience Denmark during the low season, since campground are closed for nearly half a year. Moreover, it is a good idea to include in the main brochure the activities that people can experience out in the nature by night. Other offline promotional opportunities are articles in the physical newspapers and magazines, commercials or interviews on the radio stations and TV – this can be done to attract both local/regional, national and international guests, targeting also the closest neighbouring countries (e.g., Germany, The Netherlands, Belgium).

The online marketing can be started on the official website of the DMOs, serving as an informational platform for sharing practical tips and advice for people who search for inspiration. Having an informational website that presents and explains night sky experiences will allow writing longer articles that can serve as a guide for potential guests, who want to get a stargazing experience. But different social media platforms can be used for targeting different groups and they all have slightly differentiated aims.

Facebook is the biggest social media platform globally with a 2.9 billion users, but it is difficult to limit the age rate or the audience. It is used to connect with families, friends and to share photos with sometimes long posts. It has a managerial function where it is possible to promote the new services and experiences, but in order to reach the desired audience it is needed to pay, since they challenged the organic reaching (Markerly Editorial Team , 2022). Considering Facebook being the

most used social media platform in Denmark (Bjørsted-Tandrup, Knudsen, & Christensen, 2023), this platform can be used to create posts and events, where the participants are able to react, give feedback and spread the word about the experiences they had.

The majority of Instagram user range falls between the ages of 13-34 and it is the birthplace of influencers. Moreover, internationally it is the most popular platform to market products and services. The platform has some great innovative features such as the Reels, Stories or Live Videos, which might feel more personal and targeted. The channel supports the organic growth, but it is important to follow the algorithm of the platform since it changes quite often (Markerly Editorial Team , 2022). Instagram can be used in order to reach the younger generation through visual content and to find influencers, who can have an impact on their follower base.

TikTok is the fastest growing platform, and it is popular among the 14-25 years old. Primarily it hosts fun and exciting videos, which can be at the same time informative and modern (Markerly Editorial Team , 2022). This platform is a great way to attract the younger generation, although recently TikTok was banned in every Danish municipal instance, meaning that DMOs are no longer allowed to use this platform for promotion/advertisement since they are funded by the state (Eriksen, 2023). As an alternative, Instagram's Reels can be used to compensate for the ban of TikTok, but there is also an opportunity to cooperate with a stakeholder, who would promote the area through short videos on TikTok. Although, younger audience cannot contribute directly to the destination with as much economic growth by purchasing experience products as the adults and older generation – but they can influence their parent's decision-making.

LinkedIn can be used to get in touch with professionals in this field and to make a possible collaboration with them, since it is a platform mainly intended for users with business profiles (Markerly Editorial Team , 2022). It is a good choice to look for potential guides or professionals in the field of astronomy and knowledge of the night sky.

Overall, both offline promotion and promotion on social media platforms give many opportunities to gain attention from the wide range of audience. Production of the viral, unique or high-quality visual content will help the DMOs of the chosen region to achieve great visibility, which will act as a pull factor.

Discussion

In the age of sustainability and every organisation's focus on sustainable development, there are still many challenges because of unexplored or unknown opportunities, which might help to cover most of the aspects within sustainability. It is easily noticeable that every rival within tourism industry focuses on sustainability in the development strategy, although it became more difficult to stay differentiated from each other since everyone has a green agenda nowadays. Introducing new products and experiences will allow destinations and stakeholders to move from Red Ocean, where businesses compete for a greater share in the existing market with defined boundaries, towards Blue Ocean, where competition affects the outcome less as it is a brand new market with unexplored opportunities (Blue Ocean, n.d.). As it was mentioned earlier, astrotourism is still considered to be a very young category within tourism and it has a significant entrance barrier in terms of sky quality for the destinations that would like to work with this type. Especially in Denmark, where there are only few destinations that promote the area with the help of experiences under the night sky, North-western Jutland could achieve success as an astro-destination due to low competition. From the DMO's perspective, we would expand the analysis of market by adding at least one more P to the marketing mix, which is People. The additional pillar allows businesses to create a deeper understanding of the customers' needs and expectations and in our modern society, the 7P's model helps to create a highly differentiated product in contrast to the rivals (Sramkowski, 2021). The "People" pillar focuses on the company's inner workflow but also interaction with the customers. The DMOs already have a team of employees, but they might not have the required skills and competences to provide guests with knowledge about night sky or create thematic products. Therefore, this additional pillar would include experts, knowledgeable and passionate people who work within the field of astronomy and night sky to deliver communication and experience products under the category astrotourism. As mentioned in the analysis, VisitDenmark already had a campaign, where a Danish astrophotographer was used to present this type of tourism as an advocate for experiences under the night sky. Considering the fact that people's interest for the night sky in Denmark is still on the rise, there are not that many influencers or advocates who are experts in this field and could help DMOs to implement astrotourism into their development strategies as a unique product. Therefore, if a DMO would invite an influencer/expert/advocate within this field to create or represent astrotourism products and interact with customers, it will have all the chances to again attention and win customer's trust.

In general, by implementing astrotourism-related experiences at the chosen destination, it is possible to gain more attention to the importance of natural dark skies and the correct use of

artificial light. Currently, the biggest Danish astronomy-related group on Facebook, *Nordlysvarsel i Danmark* (Northern Lights alert in Denmark – own translation), counts over 95000 members that significantly increased since the Auroral storms in February 2023. During the writing period of this project, there have been several more powerful storms with extremely bright Northern Lights that were witnessed across the entire country (National Oceanic and Atmospheric Administration, 2023). Despite the fact that those geomagnetic storms have encouraged more people to step outside and look up in the sky at night, they also have their limitation on the level of interest. Northern Lights is only one of the few night sky phenomena that can be experienced at night, so focusing only on this phenomenon will not necessarily help achieving the goal of bringing importance of darkness as a sustainable element to discussion in the general public and even politicians.

As it was claimed, we have limited our target segment to domestic tourists, therefore findings of this thesis are not necessarily true if we would have faced an international group of tourists. The respondents did not represent a general viewpoint on the subjects touched upon the interviews, since we have been looking for their personal meaning-making processes through the qualitative method of data collection. As one of the interviewees mentioned in their answer – weather, landscape and prices as limited opportunities in Denmark can affect a potential astrotourist's decision-making process. In Europe, the Canary Islands and areas around the Arctic Circle are not only pioneers but also leading rivals within astrotourism, which would challenge any Danish destination that focuses on the night sky as an attraction. Although, with an attractive price and a unique product it still is possible to gain attention among domestic tourists, but also many Germans who regularly visit the Danish West coast. Three Astro Safari tours have showed an exceptional interest in stargazing activities under the night sky and the product can be developed even further to provide guest with even better experience. At the same time, the earlier mentioned VisitDenmark's winter campaign from 2021 targeted German tourist market to visit Denmark for stargazing experiences (VisitDenmark, 2021).

This paper presents darkness as a value in the field of tourism and sets a guideline for the DMOs how to implement astrotourism-related activities in their agenda without having the aim of changing the existing regulations regarding the light pollution. Even though we mentioned current regulations regarding this global problem, but that served as a background information for the further analysis. Though, the analysis of the collected data has demonstrated people viewing darkness as a valuable resource and light pollution as a threat to multiple environments.

After handing-in, the next step of the project would be presenting our findings to the DMOs to get feedback and possible initiation of the ideas described in this paper. Since astrotourism still is a new concept in Denmark, besides the presence of a Dark Sky Park on Møn, this thesis helps to understand a domestic tourists' perception of this concept. The project has a mediator role addressing the issues and findings to scientists and responsible organisations to get in contact with policy makers and politicians to raise awareness and to take actions to reduce light pollution. According to our literature review, stepping out of the borders of Denmark, there is a need to decrease the harmful effect of artificial light and to preserve our natural dark sky not only in Europe, but also globally.

In general, this thesis starts from a very local problem, which is dependency on the summer tourist season in North-west Jutland, but it can be translated to other destinations and can address the global problem of light pollution. Astrotourism must be viewed as a strong tool to sustainable development and to elongate tourist season not only in North-western Jutland, but it can also help to get a new perspective on local natural attractions, where the environment allows it.

Conclusion

The purpose of this master thesis was to understand the phenomenon of darkness as a key element of astrotourism through people's personal experiences and interpretations of it in order to explore, whether such interpretations can help tourism development in North-western Jutland in Denmark. Prior to knowing the insights of people's views on darkness, place branding was suggested as a solution tool that could be used to create a differentiated development strategy for tourism sector in the selected destination.

The analysis of light pollution map demonstrated that night sky in North-western Jutland has an exceptional quality in comparison to the rest of the country and therefore, it can be used as a resource to create unique selling propositions for branding of the destination. The analysis of Destination Limfjorden and Destination Nordvestkysten, which are the DMOs that are responsible for marketing and management of the selected area, showed a strong focus on sustainable development but also need to expand the tourist season that matches the sustainable nature of astrotourism.

Following the project's paradigm of constructivism, the understandings of darkness as a phenomenon were acquired with the help of 17 qualitative interviews, analysis of which highlighted themes that showcase darkness as a valuable element not only from the experience perspective, but also sustainability. The interviewees' shared emotions revealed to the project that darkness is an extremely valuable resource that lacks attention among most of the people, businesses and government in Denmark, which also reflects the reality presented in the articles used in the literature review. To test this theoretical view on darkness as a valuable resource that can contribute tourism development in the selected region, an experience product was carried out in the physical settings within the borders of North-western Jutland. Together with Destination Nordvestkysten three successful stargazing tours were arranged in Bulbjerg, which provided guests with satisfaction, new knowledge and an aesthetic experience. The high demand and success of the tours along with the valuable view of darkness served as the main argument for importance of including astrotourism into the destination's place branding and marketing strategies. Both place branding and marketing strategies were developed by our project team, based upon the situation analysis.

Overall, this project has proved that darkness is perceived among the potential and actual guests as a valuable natural resource. Although, many people are still not informed about the benefits of darkness, as it lacks attention among Danish businesses and politicians, and

therefore it leads to unexplored opportunities. The valuable interpretations of darkness and the success of guided tours under the night sky must be considered to be a part of the development strategies among DMOs, Destination Limfjorden and Destination Nordvestkysten, which will allow them to achieve sustainable development through the destination's deseasonalisation. Since darkness is a dominant element during winter months, where the number of tourists is extremely low in the outdoor destination, it can be used to create astrotourism products and experiences to attract the general group of tourists, who usually visit the area during summer.

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