

# NIGHT LIGHT PROJECT INTERREG EUROPE

## IN-DEPTH ASSESSMENT REPORT BY PEERS ABOUT HAJDU-BIHAR REGION (HUNGARY)

- Based on Peer Review held on 18th–22nd September 2017 -  
December 2017



Linking Wellness & Nature for future generations:  
The strength of the spa sector jointly with the  
uniqueness preserved dark skies in Hortobágyi National  
Park for developing sustainable astrotourism  
at international level

**Night Light**   
Interreg Europe



European Union  
European Regional  
Development Fund

IN-DEPTH ASSESSMENT REPORT

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### Index

1. INTRODUCTION
2. OVERVIEW AND BACKGROUND: Findings and Recommendations
3. CROSS-CUTTING: Findings and Recommendations
4. LIGHT POLLUTION: Findings and Recommendations
5. CONCLUSIONS

## 1. INTRODUCTION

### A) SHORT INTRODUCTION TO THE NIGHT LIGHT

In the Night Light project regional authorities from The Netherlands, Hungary, Spain, Luxemburg, Denmark, Slovenia and Italy has joined forces to improve their regional policies for the prevention of light pollution, preservation of dark skies and the sustainable exploitation of dark sky places. The project introduces packages of regional policy measures for each of the partner regions that will result in a lasting reduction of light pollution, the designation of nature areas where dark skies are protected and the introduction of new services and facilities to attract ecotourism to these dark sky areas.

### B) SHORT INTRODUCTION TO PEER REVIEW METHODOLOGY

Night Light peer review methodology helps regions to improve their policies for the prevention of light pollution, preservation of dark skies and the sustainable exploitation of dark sky places.

The Night Light peer review methodology standardises the relevant aspects that need to be measured, in order to enable experts with

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different background, to assess the regional situation in an objective way. By this, they will be able to give appropriate recommendations on the field of prevention light pollution and preservation of dark skies at the host. The other important advantage of peer review is the selection of experts, who are practitioners in the field of the assessment, which means that the recommendations given by them after the review will be practical and realistic.

## 2. OVERVIEW AND BACKGROUND

### A) GENERAL OVERVIEW AND CONSIDERATIONS

According to the working plan of the NIGHT LIGHT Project, a serie of different "Peer Review Week" are taking place as one of the main activities to develop by the Project, the peer review weeks are hosted by the participant partners. The goal of this activity is to analyse how the host is performing in the topic, therefore a pool of recommendations on what positive actions must be reinforce, as well as how other weak points could be improved, thanks to a Report provided by the expert group based on the findings during the week spent in the territory jointly with different stakeholders.

Afterwards, the host will take into consideration this Report while building up its own Action Plan to be implemented according to the feasibility of recommendations and their particular situación and capacity.

Somehow, the peer review week turns into a kind of "Friendly Audit" by colleagues taking part in the partnership and experts on the topic of dark sky preservation and its exploitation as astrotourism resource, brought by partners.

This peer review took place between 18th September 2017 and 22th September 2017, in the Hadju-Bihar región, the basement was located in Debrecen and different meetings and on-site visits took place in different municipalities, the week was very well organized and all the event forseen took place smoothly.

### B) PEER REVIEW FOCUS

A summary document was sent by the host some weeks in advance to the proper peer review week, this document was a basement for the peer review team to first understand the starting point and therefore to organize itself about what to find out and by who to develop such a task.

The information provided was split in three parts as follows:

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- I. State of play of regional policies
  - II. Challenges and Expectations by the host
  - III. Expertise needs to bring to the peer review

### **I. State of play - Improving regional policies to reduce light pollution and protect and valorise dark night skies.**

In Hungary regulation of light pollution has started but needs further activities as artificial light has negative impact on the organisms, their communities, the natural landscape and the starry sky. There are two national legislations:

Hungarian Act No. XCI. of 2008 amending the Hungarian Act on Nature Protection (Act No. LIII of 1996) focusing on protected areas: "... In protected natural areas stationary outdoor artificial lighting in outer areas or fields where building activities are not intended - except lighting necessary for the public transport facilities' safe operation - must be designed so that the protected animals or species of Community interest not to disturb, endanger, damage."

- Hungarian Government Decree 211/2012 (VII. 30.) about the National Requirements of Building and Town Planning (Building Code).

- This newly updated Decree includes a clear definition of light pollution (Annex 1.) including the general requirement to focus lights on where and when it's needed.
- Beside the definition, there are two sections in the regulation including light pollution:
  - o The first one is related to the health issues of light pollution in buildings
  - o The second one provides specific instructions of the lighting of buildings, public lighting, sky signs and advertising lights.

There are three International Dark Sky Parks in Hungary and one is within Hajdú-Bihar County. Hortobágy Starry Sky Park was announced as a Silver Tier International Dark Sky Park on 25 January 2011. To increase public awareness and pay society's attention to the issue of light pollution, the National Park organizes stargazing walks and specific programmes on Dark Sky Park values as well as favourable lighting practices; besides, a public astronomical observatory is located in the Field Study Centre.

Nevertheless, generally speaking the attitude of citizens to light pollution issues need to be improved, based in a previous understanding of tis benefits. People are rather afraid of darkness, "the more light, the safer" is in the minds of them.

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## **II. Challenges and Expectations by the host**

### **II.a) Challenges for the host**

As a main challenge, the attitude should be changed first on different levels:

- On national policy-making level the importance of tackling light pollution is much lower than required. As not that much economic benefits have been found in connection with this issue, it is not really on the agenda of the administration.
- More local politicians consider about streetlight refurbishing works and tend to disregard the interest of nature and they usually are not aware of the most favourable and modern lighting technology.
- People are rather afraid of darkness, "the more light the safer" is in the minds of them.

As for the Hortobágy Starry Sky Park concerns:

- The problem of light pollution and the Park is not sufficiently known by the inhabitants and decision-makers of the neighbouring settlements.
- The sky glow of neighbouring settlements and the disturbing lights of some exact premises are significant problems.
- Developments (public lighting, premises) do not consider the interests of the park
- Eco and astrotouristic utilisation is low with poor infrastructure and not much possibilities are seen.

### **II.b) Expectations about recommendations after the peer review week ?**

The host was looking for ideas and recommendations for awareness-raising on the above-mentioned levels:

- How to reach the threshold of local/national politicians with light pollution issues?
- How to change the attitude of the citizens to darkness and how to teach them environmental and eco-friendly behaviour?

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- How to attract professional working force as well as appropriate financing? Development suggestions for the Hortobágy Starry Sky Park
  - Further recognition on local, national and international levels as well.
  - To decrease light pollution of the park.
  - Take advantage and improve the potential of astrotourism and ecotourism.
  - How to have closer and stronger cooperation with the municipalities, farmers, electricity companies and other responsible authorities (e.g. road operators)?

## EXPERTS TEAM AND AGENDA

Once the partners got the information provided by the host in advance, it was time to select the proper experts to bring by each partner participating in the peer review week.

Actually, a great team was built up among all of the participants, who were coordinated by Avila County Council, playing the role of coordinator of the peers in this first peer review week, based on the experienced gained in other European projects using the same methodology.

The information provided by the host was read carefully by all the team, nevertheless, a first meeting was held during the first day, once the whole group was together, in order to set the goals, the methodology on daily basis according to the agenda foreseen, where both formal and informal meetings were in the planning, as well as both public and private stakeholders would participate in the meetings. Also different on-site visits took place.

The peers were reminded the expectations of the host, the aim of the methodology, how to proceed daily, actually a daily summary was agreed before ending each journey, as well as the following stages such as :

- Friendly atmosphere
- How to get info through questions open/closed
- Translation time, transfers, places to visit
- Daily summary to be conducted by the coordinator
- First draft of recommendation to be submitted on Friday, Media attendance
- Deadlines for gathering information after the peer review
- Final Report to be prepared by the coordinator.

The panel of experts was a multidisciplinary team, covering the different fields of interest for the host, the meetings and daily summary run smoothly and all members agreed of the first draft of recommendations.

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## AVILA COUNTY COUNCIL, SPAIN

Coodinator: Roberto Rodriguez, Avila County Council, Marketing expertise and Tourism

Expert 1: Susana Malon, Luminica Ambiental Co, Light Pollution expert

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## LA PALMA, SPAIN

Ana Castañeda, La Palma, Tourism Management and Infraestructure

Expert 2: Ana Garcia, La Palma Astronomy Tour, Astrotourism

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## NATURE PARK OUR, LUXEMBOURG

Laurent Spithoven, Nature Park Our, Sustainable Tourism

Expert 3: Carole Ewert, Regional Tourism Office of the Luxembourg Ardennes, Marketing and Communication

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## SAMSO ENERGY AKADEMY, DENMARK

Peter Christensen, Samsø Energy Akademy, Sustainable Development Education

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## FRYSLAN PROVINCE, NETHERLANDS

Expert 4: Sjon De Haan, Wadensee Nature Park, Entrepreneurship in protected Areas

According to each one field of expertise and the findings, the work was split by topics to be detailed developed by different contributions, that were sent by the team in November.



### **NIGHT LIGHT - Interreg Europe Project**

PEER REVIEW IN HAJDÚ-BIHAR (HUNGARY) 18-22 September 2017

Peer Review Organization for bulding up the Final Report

| PEER TEAM          | General / County            | Transversal                     | Tourism / Astrotourism         | Dark Sky                |
|--------------------|-----------------------------|---------------------------------|--------------------------------|-------------------------|
| RODRIGUEZ, Roberto | Coordination                |                                 | Marketing                      |                         |
| MALON, Susana      | General: state art, coop... |                                 |                                | Technical / Legislation |
| CASTAÑEDA, Ana     | General: state art, coop... |                                 | Tourism Manag - Infrastructure |                         |
| GARCÍA, Ana        | General: state art, coop... |                                 | Astrotourism - Infrastructure  | Technical / Legislation |
| SPITHOVEN, Laurent | General: state art, coop... |                                 | Sustainable Tourism. +Darkness |                         |
| EWERT, Carole      | General: state art, coop... |                                 | Marketing / Communication      |                         |
| CHRISTENSEN, Peter | General: state art, coop... | Education / Potential Awareness |                                | Efficient Lighting      |
| DE HAAN, Sjon      | General: state art, coop... |                                 | Tourism / Entrepreneurship     |                         |

## AGENDA FORESEEN BY HOST

The agenda was organized by the host as follows, highlighting the fact that several documents were provided by the host as supporting information about background, legislation, presentations given, studies about light pollution and dark skies in the territory, ...etc.



### PEER REVIEW MEETING

18<sup>th</sup>-22<sup>nd</sup> September 2017

Hajdú-Bihar County, Hungary

DRAFT AGENDA – v1

| Date   | Item   |
|--|--|
| <b>Monday 18<sup>th</sup> September 2017</b>   |  |
| 18:00-18:50  | <b>Peer Review Preparatory meeting</b><br>- Introductions and background briefing with Peer Review experts<br>- Review key topics and agenda<br>- Agree on approach and mutual expectations<br><i>Venue: Hotel Aquaticum</i> |
| 19:00-   | <b>Dinner</b><br><i>Venue: Krúdy Restaurant -4 Medgyessy walkway, Debrecen</i>   |
| <b>Tuesday 19<sup>th</sup> September 2017 – Overview of state-of-the-art, interviews/discussion with core stakeholders</b><br><i>Venue: Hajdú-Bihar County Government, 54 Piac Str., 4024 Debrecen</i> |  |
| 09:00-   | <b>Registration</b>  |
| 09:15-09:40  | <b>Welcome by host institution</b><br><b>Role and activities of the Hajdú-Bihar County Government</b><br>Dr. Csaba Dobi – Head Notary, Hajdú-Bihar County Government   |
| 09:40-10:15  | <b>Roles and competences of chief architects in Hungary</b><br>Andrea Gonda-Magyar – Chief Architect, Hajdú-Bihar County   |
| 10:15-10:45  | <b>Discussion/interviews with the experts of the Hajdú-Bihar County Government</b>   |
| 10:45-11:00  | <b>Coffee break</b>  |
| 11:00-12:30  | <b>Meeting/discussion/interview with local policy makers</b><br>(vice-)mayors and representatives of settlements/local governments of the county   |
| 12:30-13:30  | <b>Lunch</b>   |
| 13:30-15:00  | <b>Roundtable discussion with national decision maker expert(s), representatives of regulatory bodies and energy suppliers</b>   |
| 16:00  | <b>Discussion of Peers</b><br><i>Venue: Hotel Aquaticum</i>  |
| 19:00-   | <b>Common dinner</b><br><i>Venue: Pálma Restaurant - 44 Simonyi Str., Debrecen</i>   |
| <b>Wednesday 20<sup>th</sup> September 2017 – Interviews/discussion with core stakeholders, site visit</b><br><i>Venue: Hajdú-Bihar County Government, 54 Piac Str., 4024 Debrecen; Nádudvar</i>       |  |
| 09:00-10:30  | <b>Discussion with relevant members of the Regional Stakeholder Group – part I.</b><br>Experts from astronomy association, engineering office, tourism offices, university, lighting technology association                  |
| 10:30-10:45  | <b>Coffee break</b>  |
| 10:45-12:00  | <b>Discussion with relevant members of the Regional Stakeholder Group – part II.</b><br>Experts from astronomy association, engineering office, tourism offices, university, lighting technology association                 |





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|--|--|
| 12:00-12:45  | <b>Lunch</b>   |
| 12:45-15:30  | <b>Site visit to Nádudvar to examine public lighting</b>   |
| 16:00-   | <b>Discussion of Peers</b>   |
| <b>Thursday 21<sup>st</sup> September 2017</b><br><b>Overview of state-of-the-art, interviews/discussion with core stakeholders</b><br><b>Venue: Hajdú-Bihar County Government, 54 Piac Str., 4024 Debrecen</b>            |  |
| 08:30  | <b>Leaving from the hotel by bus</b>   |
| 09:30-09:40  | <b>Welcome</b><br>Dr. Zita Kovács – director, Hortobágy National Park Directorate  |
| 09:40-09:55  | <b>Introduction of the Hortobágy National Park</b><br>Hortobágy National Park Directorate  |
| 09:55-10:15  | <b>Introduction of the Hortobágy Starry Sky Park</b><br>István Gyarmathy - Nature conservation officer, Hortobágy National Park Directorate  |
| 10:15-10:35  | <b>Coffee break</b>  |
| 10:35-12:00  | <b>Meeting of the employees/stakeholders of Hortobágy National Park / Starry Sky Park</b><br>Hortobágy National Park Directorate, tourism experts, Hortobágy Fish Farm, Hortobágy Nonprofit Ltd. |
| 12:00-13:00  | <b>Lunch</b><br>Hortobágy Inn  |
| 13:00-16:00  | <b>Site visit –Narrow gauge railway to Hortobágy fishponds</b>   |
| 16:00-19:00  | <b>Discussion of Peers, preparation of final presentation</b>  |
| 19:00-   | <b>Common dinner and stargazing</b>  |
| <b>Friday 22<sup>nd</sup> September 2017</b><br><b>Presentation of observations and preliminary recommendations of Peers open to the press</b><br><b>Venue: Hajdú-Bihar County Government, 54 Piac Str., 4024 Debrecen</b> |  |
| 09:30-10:00  | <b>Registration</b>  |
| 10:00-10:10  | <b>Welcome</b><br>Zoltán Pajna – President, Hajdú-Bihar County Government  |
| 10:10-10:30  | <b>Introduction of Night Light project, peers and the happenings of the week</b><br>Melinda Mátrai – Head of Unit, Hajdú-Bihar County Government   |
| 10:30-11:15  | <b>Introduction of observations and preliminary recommendations</b><br>Roberto Rodrigues – European Projects Senior Officer, Avila County Council  |
| 11:15-11:45  | <b>Questions and answers</b>   |
| 11:45-   | <b>Farewell lunch</b>  |
| 11:45-12:15  | <b>Press conference</b>  |

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### 3. CROSS-CUTTING

#### KEY FINDINGS ABOUT CROSS-CUTTING ISSUES

- **Hadjú-Bihar region**

The region has some great assets to make it a promising international destination. There are the Spa's in the Area that already attract many tourists, there is the Hortobágyi National Park, indeed a dark area and there are the Tisza-tó lakes, also the town of Debrecen has much to offer. Nevertheless, all strong brands that are barely connected to each other.

The area is well connected by road, railway and Airport. The increasing activity at the airport results in easy and cheap access for the international tourists, especially short stay vacations. What is lacking are the connections, to get from Debrecen to Hortobágyi national park and have an excursion is possible but it takes a lot of effort from the tourist. The area also has a tremendous resources in its History: The reformation In Debrecen, the story of the grey-cattle and how it connects the national park to the landowners in Debrecen, the trekking of the cattle to markets as far away as Nurnberg, so, the region as lot of cultural resources in terms of traditions and legends to be told and showed to the tourist.

#### **Debrecen**

The town of Debrecen has a well developed spa and hotel sector, it is a lively town that can promote it's status as centre of Hadjú-Bihar. The town is well kept and can accommodate tourist for one or two days with shopping and culture.

#### **The Spa Sector**

Existence of a well developed tourism offer in the scope of "wellness" It is a very big product but it also seems to cater for mass tourism. Moreover, the complexes are huge, a good attendance: 400.000 visitors per year around Debrecen with an average stay of 2,6 days or up to 30.000 people out in the thermal region on sunny weekends.

The are good national & international travel connections (e.g. train station, Airport), the tourist sector is distinctively organized from a national to a regional and local level (with over 60 tourism offices, tourism representatives declare their willing to include quality dark sky offer.

Perhaps a wider scope beyond the spa sector could be combined with it, thus the offer could be more complete as an integrated experience.

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### **Hortobágyi National Park**

This is a unique place, well known by bird watchers from all over the world, it is a dark sky park and a world Heritage. The park has a nice, small, visitor centre well combined with the workshops for traditional crafts. The bird watching huts are nice, the train into the marshland is an attraction on it's own. We have not been to the zoo (sanctuary) but what we gather from the social media is that it isn't much appreciated by the visitors. Also the events organised seem to be important assets. The guesthouse with the observatory mainly caters for school children, this is important but not a market that helps you to further develop your product and the surrounding areas. From the documents and our interviews we gather that the park is indeed very dark but this fact was not well communicated.

Within the park and the village centre we **miss the integration** of the different items, the combination makes it into a strong product with a focus on responsible tourism. The feeling for the group is that several actions are taking place but several of them in an isolated manner, so to boost cooperation at different levels it is a must on the territory.

- **Awareness about darkness**

How to make the general public understand the importance of reducing light pollution? Hajdú-Bihar County owns one of the biggest unpopulated and darkest areas in Hungary. At least people know about "their" unique and beautiful dark sky. On the other hand, the population expresses a strong demand for modernisation and security, which risks to create counterproductive effects. Throughout the meetings with all possible representatives, local and regional actors, we experienced a wide interest to discuss the awareness and importance to reduce light pollution.

It seems clear the need to reinforce the high potential some parts of its territory has in terms of dark sky preservation.

- **General lack of awareness about dark sky potential**

One important aspect that was brought to our attention several times during the meetings with representatives from different bodies and organisations was the lack of awareness about the great resources this region owns and the existing potentials related to the introduction of dark sky areas and astro-tourism, therefore, reduced knowledge about light pollution issues, this also affects to some of the other findings made by the Peer Review team:

- Huge potentials, but isolated actions taken
- Communication seems missing in some cases

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## RECOMMENDATIONS ABOUT CROSS-CUTTING ISSUES

- **Training at Educative sector about darkness**

To overcome the negative feeling associated to darkness, to investigate possibilities of **integrating the educational material**, linking the activities about darkness and its benefits to local educational institutions in order to work with future decision makers.

- **Show the potential and engage local communities**

One of the mayor findings made by the Peer Review team is that there are great potentials for creating awareness by strengthening the existing links between **Spa & Nature & Culture & Gastronomy** activities in the Hortobágyi National Park and the whole Hadjú-Bihar Region.

A lot activities are taking place in the region about Spa sector, but the challenge is to link this strong sector to some complementary activities in order to offer an integrated package to visitors, giving them the option of a complete experience in the region: Wellness + Nature.

- **EU projects to share and learn good practices**

Investigate possibilities of linkage to other EU projects or programmes within the Region, in the field of Sustainable Tourism, Astrotourism, Traditions...etc.

## 4. LIGHT POLLUTION

### KEY FINDINGS ABOUT LIGHT POLLUTION

- **State of the art of Lighting infrastructure**

Public lighting infrastructure lies within the responsibility of the local municipalities. Overexposure is common and old constructions are often replaced by oversized infrastructure ignoring technical aspects to decrease light pollution effects (full cut off, lighting temperature, etc.). Investment priorities are mainly cost cutting (through efficiency) and increase of lighting points. Municipalities often do not have own funding possibilities and do look out for subsidisation opportunities for those kind of invests.

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Lack of an accurate strategy to control the new outdoor lighting installation projects or the refurbishing of the existing ones, actually, it seems they are going to renovate the outdoor lighting installations but the trend in the use of LED technology is not clear. It was mentioned that the Correlated Colour Temperature (CCT) it would be 4000k, what is against no light pollution criteria (see recommendations). The technical know-how in the area should be improved

Another issue to improve is the communication between different levels and/or stakeholders, in some cases work but could be improved. Generally speaking the promotion of the tourism in the area is fine but maybe it could be improved in a more proactive way. Besides, the info about the visitor profile could come in handy for organizing the promotional activities for the tourism offer.

- **Legal frame distinguishes light pollution**

Generally speaking the system of regulations and policies seems to be fine and running smoothly. Nonetheless, when it comes to the accurate topic of light pollution, the existing legal frame is good but eventually not showing improvement since their implementation. The Nature Protection Act and Building code figure a good basement for the implementation of further regulations concerning light pollution. Well structured spatial planning tools (e.g. county spatial plan, settlement spatial plan, etc.) deliver potential starting points. Important role of Hajdú-Bihar County Government (regional development, spatial planning, coordination)

It is **highly positive the stakeholders are willing to discuss about light pollution** and take part in such a meetings and consider different points of view.

Even though there are different technical documents about lighting, nonetheless, there is no specific legislation on outdoor lighting related to avoid light pollution in the territory, except in the Hortobágyi National Park, although this one must be updated since the technology in artificial lighting has been developed in recent years thanks to LED technology.

#### RECOMMENDATIONS ABOUT LIGHT POLLUTION

- **Create a working group on light pollution within the region**

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Create a working group related to light pollution that includes scientists, universities, ecological and dark sky associations, etc. to develop a **complete state of art in light pollution and the effects on humans, environment, climate change** (similar way to the Spanish Lighting Committee that created a working group in chronobiology, astronomy, ecology and human health, among other aspects related to the night impact of the artificial light)

It should be set the main **stakeholders target group** to involve when facing light pollution in the region:

- Local and regional authorities
- Local and regional organisations and institutions
- Politicians
- Local citizens/stakeholders
- Tourist sector

Each group individually has to be evaluated according to the overall awareness strategy.

This often requires special local knowledge. Therefore, it might be a good idea to seek out and **engage key people who could act as ambassadors** for the cause and the project. In order to convince and activate these ambassadors it is important to find out what can “sell the project” and what the project can offer the individual stakeholders.

**Meetings and conferences:** Like mentioned before it is important that the light pollution issues continuously are put on the agenda. A good platform to start off in order to reach as many people and target groups as possible is by attending relevant meetings and conferences in the region introducing the light pollution issues, by for example forming **working groups**.

- **Create Awareness about Light Pollution**

The overall communication strategy is central to create awareness on light pollution in the Hadjú-Bihar Region. The strategy should take into account; when and how politicians and officials should be involved? It is important to be proactive and to inform early about the upcoming activities in order to avoid misunderstandings and to align the partners' expectations. On the other hand can a falsely timed press release or other information lead to large protests and even harm a project.

There might be a need to build network and to develop a **communication platform**. Commonly local newspapers and the municipal website are convenient to inform about public meetings, but social media such as Facebook and Twitter might provide opportunities to reach out to broader groups in the local area.

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It is important that the different target groups understand the light pollution issues and that they can identify themselves with the plans and activities. In other words, it's important to communicate clear goals and messages. Some brochures, short video could help to this goal to communicate the issues and challenges, the effects on the biodiversity and on humans, the lack of stargazing sky, the future plans and not at least the many potentials of the activities.

It is important constantly to achieve results and to demonstrate proactivity, setting up realistic and achievable milestones.

In this context, **good practise and stories** can be an important tool to provide images on the experience and vision. Stories and experiences from similar situations and issues can help providing inspiration and ideas for creating awareness and moving forward in the process.

- **Awareness Campaign about Darkness benefits**

Negative artificial effects have to become more tangible (*"We only believe what we see"*). General public and policy makers must be invited to see what inefficient lighting infrastructure is causing to "their" beautiful dark sky. This can be done by selective training but sometimes a small hint is sufficient to sharpen observation and raising awareness (e.g. media campaigns, field experience, etc.).

Organize and develop a **light and dark experience** where locals can learn about the darkness. Let them experience the way their eyes adjust when it is dark and when there is some light. Different types of light are shown. If you make it mobile (truck / container) take it to the villages.

Hajdú-Bihar County with its natural heritage and the Hortobágyi National Park is in possession of its own "Dark Sky Pearl". This relevance could be one of the future key messages building up an ecology-minded identity and convincing policy makers in elaborating innovative strategies and putting trust in unconventional guidance through light pollution issues.

- **Technical workshops**

Plan and implement **technical workshops** for local stakeholders on lighting issues. In the medium term provide a **Handbook on Light Pollution** to get the basic knowledge, regulations,...etc.

"Starlight" or "No light pollution" criteria are basically related to:

- **ULORinst (Upper Light Output Ratio) of luminaries = 0% (< 1%)**

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Ratio of the upward luminous flux of the luminaire, measured under specified conditions with its own lamp(s) and equipment, to the sum of the individual luminous fluxes of the same lamp(s) when operated outside the luminaire with the same equipment, under specified practical conditions

- **Spectral radiance of the lamps without blue light content**

Lamps must emit energy flux under 500nm lower than 5% of the total flux emitted in the whole visible range. In terms of Correlated Colour Temperature (CCT)  $\leq$  2200K or PC Ambar

- **Regulation luminous flux during the night**

In the luminaires there must be implemented a reduction of power and lumen output for different hours during the night, related to the night activity.

- **Illuminations levels on the ground**

Almost the  $E_m$  (lux),  $U_m$  (%),  $L_m$  (cd/m<sup>2</sup>),  $U_o$  (%) and  $U_i$  (%) parameters have to respect the international criteria published, as we mentioned before, but avoiding the over illumination on streets and the lost light toward the external areas and facades that produce intrusive light.

- **Legal framework and Technical aspects**

The actual revision process of the county spatial plan to end 2018, is a unique opportunity to introduce high standard regulation criteria (e.g. zoning). This step would generate an additional legitimation to fix details (for technical/physical factors for the use of artificial light: light temperature, orientation, shielding, etc.) on a lower level (e.g. settlement spatial plan, settlement identity handbook, municipality decrees).

Working on a legislation draft that involves municipal technicians, scientists, lighting manufactures, energy companies, ecological and dark sky associations, etc. in outdoor lighting based in the actual technology, taking care about international lighting recommendation, for example: Illuminations levels in roads, streets, pedestrians, (Directive 2009/125/EC (Eco=design energy devices). This legislation must include the "starlight" or no light pollution criteria, following the report of light pollution working group created as: Canary Islands, Catalonia, two regions in Chile, Slovenia and other Italian regions.

- **Lighting infrastructure**

Modernisation of lighting infrastructure is nowadays based on the idea of energy efficiency. But the efficiency aspect is not a criterion for exclusion compared with prevention of light pollution (e.g. EON business model 4000°K is also offered as 3000°K model).



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Investment strategies and priority criteria should be revisited under the aspect of environmental concerns. Adducting best-practice examples, counselling actors, innovative projects (e.g. CityEnGov) & clusters, active cooperation with Debrecen University etc., could be fruitful to the process of sensitisation, showing municipalities that affordable lighting infrastructure including aspects as cost cutting, energy efficiency, norms, maintenance, security aspects, acceptance and environmental safety are realisable.

Drawing a “zoning” of the territory based on vulnerability to light pollution, including dark sky and environmental protected areas and also municipalities, roads, industrial areas and others.

Carrying out a pilot project in an outdoor lighting installation (it would be better in the Hortogavy area) to demonstrate that using this kind of “starlight” criteria, safety people is done, and international recommendations in terms of illuminations levels and NO light pollution are fulfilled.

- **Apply for a Starlight Certification**

Start the feasibility and procedure analysis to get the Starlight Reserve Certification of Hortobágyi National Park, in order to preserve de night sky and environment and to promote the astronomical tourism in an efficient and sustainable way.

A Starlight Reserve is a protected natural area where a commitment to protecting the quality of the night sky and access to starlight is established. Its function is to preserve the quality of the night sky and the different associated values, whether cultural, scientific, astronomical, or the natural landscape.

## 5. TOURISM - ASTROTOURISM

### KEY FINDINGS ABOUT TOURISM AND ASTROTOURISM

- **Need of Strategic Plan for Sustainable tourism development & marketing**

One important aspect that was brought to our attention several times during the meetings with representatives from different bodies and organisations was the fundamental lack of a clear touristic development plan as well as a marketing plan of the Region, created or revised that contains the phases of regional development in tourism. Therefore, it is the perfect moment to decide which is the regional strategy on tourism development, in order to cooperate and coordinate different actions.

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Furthermore, seems a bit underestimated the high potential that the region has for develop astrotourism, jointly to spa, bird-watching, hiking, biking,...and so on. However, the proper sector need to understand how important is for their own economical sustainability.

## RECOMMENDATIONS ABOUT TOURISM / ASTROTOURISM

- **Potential integration of Spa sector jointly with Hortobágyi National Park**

The touristic future of Hajdú-Bihar is one of sustainable tourism where the whole area feels that they are part of the product. The inhabitants and companies take care of the environment, reduce light pollution and are great hosts. They will do this if they being aware they have been taken part in further development of the area from the **involvement of local communities**. Through tourism valuable assets like the national park and the dark sky park become valuable assets for the people living on the edge of the park. They need to understand that darkness is needed for stargazing but even more important for the nature in the area.

The spa sector can bring in **new target groups** that are interested in doing more than being in the Spa, they come outside the main season and go for a visit to Debrecen, spend an day and evening in the national park to experience the nature and learn about the stars. They learn about the way the herdsmen used the stars to navigate through Europe, somehow coming back to their/own roots.

The new target to be considered as potential could be some of the following:

- Traditional Spa guests
- City trippers from Western Europe, make the stay longer by offering a dark sky or a Hortobágyi World heritage trip
- Cultural tourist, higher educated they want the story about regional traditions and legend
- Bird watching guests as Nature oriented guests
- Education guest, through offering various Astronomy courses

Make the herdsman and the grey cattle a centre stage of the promotion in order to easily connect the products (national park, dark sky, World Heritage, lake, Debrecen) to this story.

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An inspiring combination of sunset, gastronomy and night sky observation even in winter when the number of clear nights seems to be higher than in summer could become an extra attractive offer for the visitors to the Spa sector. Therefore, **activities connecting local gastronomy, culture and heritage and natural resources** using its synergies. For example, a dinner while clients are receiving a talk about astronomy, followed by a night visit to the park and stargazing

Make the **key stakeholders understand by experiencing dark sky themselves**, show them the potential of Spa+National Park, take the owners of the Spa's to the national park and work with them on a pilot to bring their guests to the national park. Also, try to bring the villagers and politicians of the surrounding villages to the park and let them **experience the dark and the light pollution**. Teach them about what is good about darkness but also how they can make clever use of light

Taking into account the **strength of the spa sector** in the area as well as the **uniqueness of the National Park** any project to develop tourism and specifically astrotourism to international level should join wellness, nature and together with enjoying the night sky. Excellent natural resources in addition to the "pearl" of Hortobágyi National Park what is the darkest place of Hungary.

*spa = wellness, nature = wellness, nature = darkness = calm = wellness = health! "Health" could be a very significant subject within the communication for the touristic identity.*

In general it is recommended that the project team organize several bus tours to the nature park for the different target groups. This will give stakeholders the opportunity to see for themselves the potential of the Dark Sky area and the park - and at the same time it will help to **create a common reference point for future discussions**.

On the other hand, apparently there is a link to other innovative touristic projects (e.g. Oxenweg project) and cultural resources (e.g. shepherd's orientation), what certainly bring opportunities for Rural development: actually searching for new economic opportunities.

Is this a dream? Yes it is, but it is possible. After a few days in the area we believe that it has a big potential.

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- **Need of a Sustainable Tourism Strategy**

When building up the strategy on Sustainable Tourism, try to gathering as much stakeholders as possible, and make it compatible to the general touristic offers of the region (being part of the regional "identity"). The strategy needs to set a management structure, the target group, the accessibility, a defined number of marketing products and a communication strategy at different international, national and local levels.

It is always important to have different visions and perspectives when drawing up a common strategy, since what is really important is that everyone participates and decisions are made upon agreement, which will facilitate the implementation later on.

It must be stressed a "sustainable" tourism strategy because tourist, that come for products like the world heritage and the dark sky park, expect things to be sustainable. We also feel that a sustainable strategy is something for the long term, not for short-term gains.

- **Include Regional Tourism as a priority at National level**

The **selection of priority regions** by the government decides about future funding possibilities and touristic and economic development. Hajdú-Bihar County needs to identify and declare an **extraordinary position** within the national tourism sector, assuming innovative approach and proactivity.

Use these **sustainability** aspects and the unique character of the regional resources as an advantage in advertising to be selected as priority regions for tourism by the government.

- **Improvement of Marketing and Communication Touristic offer**

Modern tourists no longer chose their destinations alone by the comfort of the available accommodations. Selection criteria are way more divers and complex. They chose a region because of the offered "package" including all kind of aspects as for example attractions (cultural, natural, social sightseeing), accessibility and mobility, gastronomy, accommodation, wellness, etc. The commercialization of this "package" premises the best tangible common identity of the offered destination.

Building up a coordinated and outstanding **touristic identity** in a region presumes a good **cooperation between regional and local stakeholders**. A touristic offer has to be clarified, **target groups** have to be defined, marketing products need to be consistent and its communication has to be uniform and omnipresent.

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Do crosslink staid events, activities and offers in your region to the subject and value of protecting dark skies.

Use **Debrecen as the ideal "stepping-stone"** destination to offer one or more day tours into its rural surroundings to experience wellness, nature, darkness, cultural heritage, etc. (hiking, biking, sports activities) all in all with a strong sustainability connotation.

Increase of selected **foreign travel agencies** offers (depending on the defined target group).

Use **popularity as marketing**. Show popular regional, national or international people experience your destination (e.g. nature, dark skies, activity,...), so, to seek out and engage key people who could act as influencing ambassadors for the destination.

Make a **social media strategy**. Right now a lot is written about the area but nobody reacts on behalf of the area, of the attractions. This is the cheapest way of promotion.

- **Astrotourism development**

The Hadjú-Bihar region has the tourist resources needed to create an astrotourism product: it has traditions related to the sky and the course of the stars, it has a National Park certified with the Dark Park category, it has a long number of legends related to the sky, has a center with telescope for informative activities, in addition to the spa and cultural and recreational capital of Debrecen ... But it is necessary an important work of planning and coordination that still needs to be done in the framework of the Sustainable Tourism Strategy mentioned before. Not only in the creation of the planning tools, but also in the implementation of the plan.

Concerning astrotourism, the Dark Sky Park of Hortobágyi National Park is only one and also a very specific part of the region and it provides some natural challenges embedding touristic offers. It is a protected area with environmental constraints, restricted accessibility and the offer of accommodations and supply is very defined. Furthermore offers for astrotourism are weather- and season dependent.

The project must be centralized and coordinated, for example, the regional government that coordinates the actions and brings together the decision-making group "**Table of the Stars**" whenever necessary. This will avoid dispersing resources and efforts in the development of activities will have better results. The actions to be taken are: entrepreneurs involvement, training sessions, include educative sector through youngsters in the target group, annual event, local artisans involvement, thematic events jointly with gastronomy and traditions.

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Think about **joining other World Heritage sites**, or dark sky parks, in international marketing at the ITB in Berlin. This can be effective once you have agreed on a joint campaign. Especially in order to invite journalist, bloggers ad to inform the organised travel companies.

However, to develop astrotourism to a viable level it is paramount to have a reliable bus touristic route connecting Debrecen, the spa resorts and the National Park. Nowadays both locally and externally there is a weak communication of how to access the activities and resources of the National Park.

Target clients should be described and activities for each target developed accordingly. Right now, children enjoy the night sky at the National Park in a range of activities but for the general public the scope is found insufficient.

- **Infrastructures for astrotourism**

It is important to take into consideration some observation infrastructures that would be ideal for the implementation of astrotourism, view points for stargazing, it is also very important to know how to take advantage of existing resources by combining them with new uses:

- Platforms on ground as viewpoints to observe the night sky, some of theme could be using the observation towers for birds
- Interpretation centers can also be adapted

In case of having the financial resources in the long term, a planetarium could become also a complementary resource.

- **Develop direct transfers from Debrecen and the major spa-towns to the National Park.**

Consider this as a shared resource an fund it jointly, it will take some years to become profitable, but you have to start. If you go for sustainable transport such as electric busses you can probably also contribute to the sustainable approach and connect with the visitor eco-profile.

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## 6. CONCLUSIONS

Taking into account the **strength of the spa sector in the area as well as the uniqueness of the National Park any project to develop sustainable astrotourism** at international level should join wellness, nature and together with enjoying the night sky

The following recommendations could be taken into account in order to implement some of them according to feasibility and road map of the Action Plan to be set later on:

### **CROSS-CUTTING ISSUES**

Awareness about Light Pollution and Darkness benefits

Training Education about darkness and light pollution to future decision makers

### **LIGHT POLLUTION**

Regional Working Group on Light Pollution

Legal Framework

Technical workshop and Handbook Guidelines

Light Infrastructures

Starlight Certification applicant

EU projects and International partners

### **TOURISM / ASTROTOURISM**

Link Spa and National Park, Wellness & Nature

Strategy on Sustainable Tourism

Transfer connections from Debrecen to National Park

Dark sky experiences on Astrotourism

Communication and Marketing

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