Exploiting Tourism 4.0 potentials for the Black Sea

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Introducing Tourism 4.0 and the Tourism for Black Sea (T4BS) project

The Tourism 4.0[1] initiative aims to unlock the innovation potential of tourism by enabling collaboration between all stakeholders of the smart tourism ecosystem to co-create enriched experiences with the help of the key enabling technologies from Industry 4.0. Tourism 4.0 ecosystem puts local inhabitants and their quality of life in the centre of tourism models and, building on the UNWTO path, supports **sustainable tourism as a driver for the UN Sustainable Development Goals.**

The basic idea is to ensure that the visitors actually respect local inhabitants and preserve environmental balance. They are visiting and willing to pay more to experience local authentic assets (culture, social traditions and local landscapes), and therefore these assets should be preserved and developed in a sustainable way. So, while still focusing on tourism and visitors, **Tourism 4.0 offers data-driven tools to support local strategic decisions in tourism for win-win solutions for local economy and socio-environmental assets,** which are the reasons why people come and visit and whose money are used for local development, on short and long term.

In this context, the Tourism 4.0 for the Black Sea (T4BS)[2] project aims to boost sectoral cooperation and allow greater usage of the Industry 4.0 technologies in tourism to achieve **more resilient, sustainable and innovative tourism in the Black Sea region**. The aim of the T4.0 for the Black Sea project is to demonstrate and assess the potential of Data Analytics[3] and the Tourism Impact Model (TIM)[4] for tourism development in the area of the Black Sea. Pilot services will be tested and the dialogue with regional stakeholders encouraged.

The project strives to enable local stakeholders across the Black Sea to increase their understanding of current digitalisation trends, patterns of tourist flows and the need to more accurately assess the impact of tourist visitors. With the **aim to foster data driven strategic and sustainable planning of tourism** in the future, it discusses the state of the art of data analytics evidence and the Tourism Impact Model. **Data-based monitoring of the sustainability of tourism performance is in fact an essential feature of local policymaking.**

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[1] https://tourism4-0.org
[2] https://www.t4bs.eu
[3] https://cinea.ec.europa.eu/news/co-creating-tourism-black-sea-data-analytics-2021-01-15_ga
[4] https://tourism4-0.org/tim/

T4BS project partners included Arctur from Slovenia, HCL Consultants, Agricola NGO from Ukraine, the Tourism Institute from Georgia, The Faculty of Natural Sciences and Agricultural Sciences of "Ovidius" University from Constanța and SANO TOURING EXPERIENCE S.R.L., SME that operates Accessible Romania by Sano Touring.

Main features of the T4BS project

The project was built upon a total of 10 stakeholders' engagement events[5], including **three rounds of local workshops in Georgia (Batumi), Romania (Constanta) and Ukraine (Odessa)** and a Final Event held in Ljubljana (Slovenia). The events allowed engaging **with a total of about 100 professional experts** from across local Authorities, Universities, CSOs and tourism data specialists across the Black Sea so to discuss the state of the art of big data use in the tourism sector and the quality of collected data.

During the first round of local workshops, the main topic of the presentations was the **use of data analysis through high-tech tools in the tourism industry**. The aim is to develop mechanisms, which will help generate valuable insights that will assist government organizations, businesses, researchers etc. in the tourism sphere to develop more sustainable strategies that will result in increased profit for all stakeholders. The workshops were aimed to set the stage for concrete piloting and experimentations in collecting local tourism data: towards a structured assessment of the socio-economic and environmental impacts of local tourism performances.

The second and third rounds of local workshops allowed to further discuss the actual data collection process in the local country and **assess the potentials for apply advanced tourism impact models, including through the use of big data algorithms**. Project partners shared preliminary results in the use of complex analysis of the data collected locally and discussed concrete patterns emerged from big data collected in selected destinations. Insights and feedback were exchanged with local practitioners, as a way to address existing bottlenecks as emerged in local practices.

Emerging findings from the local workshops

In **Romania** public institutions have a strong need for data-driven policy tools, as most administrative or policy decisions are not always supported by reliable data. Even if we work in an imperfect world, that uses imperfect data, that does not mean that the quality of evidence as support for policy and administrative decision cannot improve, especially in this context where all the technology is sometimes, literally right in our pocket. If that information can be used to profile the user to provide tailored ads, why is it so hard to be used to improve citizens' lives by using it for sustainable territorial planning (resource use patterns, traffic, tourism, land use) and other legitimate interests?

Unfortunately, Romanian institutions rarely have the necessary staff and technology for all the data that they need in their decision-making process, but this is only an extra argument to encourage institutional cooperation, which in our experience finds itself at a very low level

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[5] https://www.t4bs.eu/en/events/

at this moment. All institutions pointed to the potential that tourism impact assessment and big-data analysis would have as applications for strategic tourism and territorial planning.

Participants also highlighted that these tools still need to be strongly refined and tailored fit for their requirements. But the potential use of such data-driven tools has been acknowledged. Nevertheless, actual steps or actions into at least further discussions did not happen. Even endorsing the T4BS Declaration was a difficult to reach target – no answer to our invitations happened in most cases, or delaying the process under institutional procedures justification. For example, the Danube Delta Administration pointed at their need a clear algorithm for tourism carrying capacity. It is very hard to manage such a fragile ecosystem, when they don't have a base to how many tourists can visit the area without damaging it.

Beside publicly owned data, there is a very poor access to privately owned data. It was extremely hard to get a contact with someone inside the company and to pitch them the idea of our project and discuss our availability to buy data. Private institutions, but also public ones, that own data are reluctant to make them publicly available as they consider those as trade secrets or something that could damage their interests.

One of the main challenges emerged is the need to promote the organizational culture that would allow to fully capitalise on innovative business opportunities, as prompted by digitalisation and big data, to assess tourism impact based on robust data and objective evidence. In Romania this is for example the case for national travel vouchers issuers which could fully exploit the use of big data to offer real-time custom-made services to local tourists (they have been contacted on several occasions at top level but it was difficult to ensure their active engagement in the project at this stage).

In **Ukraine**, local stakeholders were broadly engaged with the project and appreciated the significance of Tourism 4.0 approaches in achieving more sustainable tourism outcomes. However, there is a severe lack of knowledge and capacity for effective (i.e. useful and appropriate) data collection and analysis, and a need to engage with the government bodies that have overall responsibility and power for the region where the destination lies.

The current implementation of the tools proposed is comprehensive in scope – a kind of "gold standard" for acquisition of data that in principle would help to determine the situation and trend for sustainability of a particular destination at different spatial scales. Unfortunately, too much of the required data from these localities are infrequently or not collected, incomplete, inaccessible, or not measured in line with international standards. As a result, only partial results could be obtained and no overall assessment of status could be obtained for a full test of the tools proposed.

While there surely needs to be a big improvement in tourism data digitalisation, the path of such innovation is currently being affected by lack of resources and expertise to collect and process data regularly if not in real time, concerns about political sensitivity and commercial confidentiality, and even basic interpretation of terms. For example, the understanding about who is a "tourist" varies. For the Odessa Tourism Department (OTD), tourists are people coming to Odessa for a holiday. It aims to maximise visitors to drive tax revenue for the city

budget. It does this by arranging events, and providing attractions and pastimes to entertain them, in close partnership with the private sector. Using the WTO definition of tourist[6]would not reflect the "real" tourism impact in destinations with large populations and diverse economic sectors.

Moreover, the OTD is itself not responsible for sustainability. Other departments in Odessa City Council lead on this and this complex system of structures for data generation and collection at the local level makes it difficult to have a sound "state of the art" picture of tourism patterns even at (big) city-level. The big data analytics case study proved to be valuable for the OTD in meeting its objectives. The development of customer-led tourism big data dashboards would be a useful means for improving tourism market planning in many destinations as well as providing insights about the informal tourism economy.

In **Georgia** the project promoted greater awareness rising for the potentials of big data analytics and digitalization for sustainable tourism development in the Batumi municipality and the Adjara region. Stakeholders clearly understood the role of (big) data analytics and the necessity of digital tools to make fact-based decisions. Also, an unprecedented amount of data (across over 200 indicators) was collected, analyzed and shared with relevant local stakeholders from public and private organisations as well as the academia.

Through the process of data gathering and constant communication with local authorities we learnt that there is a substantial lack of sustainable practices, digital solutions and (big) data analytics in the place. But despite that fact there is still enough data to generate information/knowledge/insights out of it, the actual problem is an absence of any digital tools to digest existing (big) data. As a result, local authorities are still limited in their capacity to take fact-based strategic decisions in most cases.

Based on abovementioned picture, state-of-the-art digital tools are much needed in places like Batumi and Adjara. Data-based assessment of coastal tourism based on environmental, social and cultural aspects are still unusual practices in Georgia, and tourism is mostly analyzed from the economic point of view. This fact prevents to fully understand the tourism impact on the sustainable development of the country. Such big data analytics are therefore very much in line with green transition and digitalization which is urgent need of our country in the process of COVID-19 tourism recovery.

When it comes to **big data analysis** it is clear that, if on the one hand local data are very difficult to get, on the other hand talking to big platforms providers is complicated. Certain data available in the market comes at high price, so local players must have a clear view of their potential use before buying them – in terms of what to get and what they want to achieve.

During the project we assessed a range of diverse data providers. When having data access, we used history data to understand and analyse main emerging patterns. Although our data-sample was limited in time and we assume that a constant flow of this data in real-time would

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[6]https://www.e-unwto.org/doi/book/10.18111/9789284420858

allow local players to follow such patterns through time and take correcting actions at faster pace.

Satellite raw data are very promising but is not so simple to interpret. Specialized partner can be used to get easy to use data, always at certain price depending on the quality and extend. Most of datasets still didn't present enough data for the efficient use of AI methods. We didn't have breakthrough successes as we were quite aware of the problems, but we certainly know much more and I'm sure the awareness of big data challenges is much higher among the partners, and it will be much easier to express next goals and objectives in the future.

Learning about the destinations involved in the project with their ideas, needs and characteristics was of immense value. New partners and service providers emerge constantly, although sometimes competition in some areas always resulted in an open discussion and strong will to collaborate. There are more and more IoT devices and sensors on the market that give possibility to gather large amounts of data. Different counters, measurement sensors and similar devices can deliver real-time info to all stakeholders involved. In addition, diverse satellite data will offer even more interesting environmental data about the destinations.

Combining this data with the data from different platforms the processing will be increasingly challenging and use of AI algorithms will be mandatory to discover and understand insights and patterns. Still, the importance to protect the personal data is paramount, while platforms and applications are allowing user the possibility to reject the tracking and so the service providers are losing their accuracy and value. The future in this area is rich of challenges and potentials but further work is needed.

Lessons and challenges ahead

The T4BS project has tested an innovative approach to assessing the impacts of tourism across a sample of local tourism destinations in the Black Sea. In doing so it has also explored the potentials offered by Big Data and Data Analytics in the region.
As a result of the local pilots, it was possible to identify some **important lessons**:

- *Tourism 4.0 solutions, building on Data Analytics, can help to deliver a better insight for policymakers as well as new services and offers for local businesses;*

- *Local stakeholders are increasingly interested in experimenting with new data technologies and innovative models for tourism development;*

- *Tourism Impact Model (TIM) is pivotal for a proper and data-based assessment of the state of the art of local tourism performance;*

- *Moving away from 'perception' and grounding the analysis of tourism impact on robust data sources is therefore essential for any destination across the sea basin;*

- *To respond also to the urgency in the post-COVID 19reality, there is a need to introduce digital tools/services which can help the tourism sector to recover and build a basis for advanced sustainable tourism.*

Nevertheless, the local exchanges demonstrated a number of **persisting gaps**:

- *Lack of robust assessment of tourism impacts in terms of social, environmental and economic effects for local destination weakens sectoral policies in the region;*

- *Available data at the local level is often scarce and even when available does not offer strong sources for a sound assessment of tourism performances;*

- *A pivotal element in assessing tourism macro-trends, big data sources are still too aggregated to offer a strong source of analysis at the destination level;*

- *Poor design and maintenance of local sectorial data sources in the region prevents the implementation of robust assessment systems at the destination level;*

- *There is a lack of experience and knowledge of local stakeholders from the public and private sector in tourism of the proper data use and management.*

Specific recommendations for local actors

Some specific recommendations have emerged for local actors across public bodies, statistical operators, academia and the private sector. Some of those are as follows:

- **Tourism authorities** should implement broad reporting procedures from licensed operators and setup public databases – e.g.: required monthly reporting from tour operators consists of an Excel file that address only the subject of number of ongoing contracts travel packages that have not been supplied yet, their value, sums paid in advance by the respective customers, sums paid to suppliers related to the respective contracts and the value of the guarantee. It seems the only purpose of the reporting is to make sure that the guarantee covers the sums to be paid to suppliers;

- **National Statistics Institutes and/or Tourism Development Departments** could coordinate the structure and form of data collected by public and private companies, so that this data could be used for analysis and policy purposes;

- **Public and private institutions** with strategic interest should have a team/department of statisticians that gather and digitalise strategic data that could be used to support policy and administrative decisions; such a data gathering department should be part of a network/working group of organisations that discuss and coordinate with Statistical Institutes and Tourism Departments the details of the data-gathering process on a bi-annual or annual basis.

- **Academia** should be part of such networks/working groups, while private companies' involvement should be considered with caution but facilitated;

- **Access to public data** requests should be constantly monitored and followed-up through a very clear and limited access to anonymous data gathered.

- **Private companies** should make available data that is not in conflict with their own direct interests as part of their licences to operate locally;

- **Institutions, academia and businesses** should also improve their ability to work together so to experiment and expand their use of big data for sustainable tourism.

Call for action

Agreeing upon the abovementioned lessons and challenges, and in line with the Common Maritime Agenda (CMA)[7], the T4BS partners are fully committed to **supporting a stronger Tourism 4.0 approach across the Black Sea**.

To do so, they support a number of specific follow-up actions including:

- *Promoting a greater and more effective digitalisation of the tourism sector across the Black Sea, as defined in the Common Maritime Agenda;*

- *Offering a robust and reliable data-management system for assessing tourism performances at the local destination level across the sea basin, also through introducing a system of stewards for the digital processes and data;*

- *Establishing permanent mechanisms for the systematic collecting of data at national and public institutions and converting this data into accessible and useful information for tourist destinations, local communities and local providers;*

- *Promoting access to and usage of advanced data sources (e.g. space data)to complement the existing data sources;*

- *Further implementing Tourism Impact Model across Black Sea destinations, including by building on results and challenges emerged from the T4BS project;*

- *Promoting the use of advanced technologies and tools for the needs of holistic management of tourism using "digital twins" for modelling tourist ecosystem (at the level of the town or a region), which would monitor and optimize developments in tourism-related activities in real-time;*

- *Further strengthening data-analysis skills and competencies across touristic destinations in the Black Sea region;*

- *Encouraging the development of interdisciplinary and cross-sectoral knowledge, skills and collaboration (tourism, technology, cultural heritage protection, storytelling, architecture, social innovation, etc.) for the development of holistic solutions;*

- *Allowing for an innovative and democratic approach in the collecting, processing and protection of personal data, and use the tourism ecosystem as a model for innovation in other areas such as smart cities, epidemiological surveillance;*

- *Encouraging activities and projects that include at the forefront and among performance indicators cooperation between stakeholders in the broadest sense (cross-sectoral, in the economy, etc.), focused on respecting the quality of life of the local community.*

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[7] http://www.bsec-organization.org/areas-of-cooperation/bsec-eu-cooperation/common-maritime-agenda

About the ICBSS

The International Centre for Black Sea Studies (ICBSS) was founded in 1998 as a non-profit organisation. It has since fulfilled a dual function. On the one hand, it is an independent research and training institution focusing on the wider Black Sea region. On the other hand, it is a related body of the Organisation of the Black Sea Economic Cooperation (BSEC) and its think-tank. Through all its activities, the ICBSS aims to foster multilateral cooperation among the BSEC member states as well as with their international partners.

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Building a Sustainable Future for the Black Sea Area

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