

SUSTAINABLE TOURISM: A NEW PARADIGM SHIFT IN INDIA'S TRAVEL AND TOURISM INDUSTRY

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Abstract

Many tourist destinations in emerging countries, such as India, Nepal, and Sri Lanka, have witnessed significant effects of the pandemic on their business, thereby adversely hitting the sector and their related economies. This research focuses on the emergence and remediation of the numerous post-pandemic problems witnessed by the Indian tourism sector and explores potential technological solutions to these grueling issues. Additionally, to attain the goal of sustainable tourism, this study analyses the initiatives launched by the Government as part of India's Digital Tourism Mission to support and revive the Indian tourism industry. Primary and secondary data were utilized in the study to identify the importance of digital transformation in the tourism sector. This research demonstrates the post-pandemic concerns of the sustainable tourism industry and highlights the resilient approaches the sample takes to the industry for emerging issues with the help of Quadruple's bottom line. It also culminates in how they use digital technology to tackle the industry's obstacles and the nation's economy. Additionally, it will highlight the various steps the Indian Government has taken to introduce digital technology to support the travel and tourism sector with specific reference to the National Digital Tourism Mission (NDTM) and put in place a paradigm shift in favor of digital tourism to realize the objective of sustainable and responsible travel.

Keywords: National Tourism Policy; Tourist Destination Management; Economy and Tourism; Sustainable and Digital Tourism; NDTM.

TURISMO SUSTENTÁVEL: UMA NOVA MUDANÇA DE PARADIGMA NA INDÚSTRIA DE VIAGENS E TURISMO DA ÍNDIA**Resumo**

Muitos destinos turísticos em países emergentes, como Índia, Nepal e Sri Lanka, testemunharam os efeitos significativos da pandemia em seus negócios, impactando negativamente o setor e suas economias relacionadas. Esta pesquisa foca no surgimento e na remediação dos diversos problemas pós-pandêmicos enfrentados pelo setor de turismo na Índia e explora possíveis soluções tecnológicas para essas questões desafiadoras. Além disso, para alcançar o objetivo do turismo sustentável, o estudo analisa as iniciativas lançadas pelo governo como parte da Missão de Turismo Digital da Índia, destinadas a apoiar e revitalizar a indústria turística do país. Dados primários e secundários foram utilizados no estudo para identificar a importância da transformação digital no setor de turismo. Esta pesquisa demonstra as preocupações do setor de turismo sustentável no período pós-pandemia e destaca as abordagens resilientes adotadas pelos participantes da amostra para lidar com os problemas emergentes, utilizando o conceito da Quádrupla Linha de Base (*Quadruple Bottom Line*). Também aborda como eles utilizam a tecnologia digital para superar os desafios do setor e contribuir para a economia nacional. Além disso, destaca as diversas ações que o governo indiano implementou para introduzir tecnologias digitais no apoio ao setor de viagens e turismo, com referência específica à Missão Nacional de Turismo Digital (NDTM), promovendo uma mudança de paradigma em favor do turismo digital para concretizar o objetivo de viagens sustentáveis e responsáveis.

Palavras-chave: Política Nacional de Turismo; Gestão de Destinos Turísticos; Economia e Turismo; Turismo Sustentável e Digital; NDTM.

TURISMO SOSTENIBLE: UN NUEVO CAMBIO DE PARADIGMA EN LA INDUSTRIA DE VIAJES Y TURISMO DE LA INDIA**Resumen**

Muchos destinos turísticos en países emergentes, como India, Nepal y Sri Lanka, han experimentado efectos significativos de la pandemia en sus negocios, afectando negativamente al sector y sus economías relacionadas. Esta investigación se centra en la aparición y la remediación de los diversos problemas pospandémicos enfrentados por el sector turístico indio y explora posibles soluciones tecnológicas a estos desafiantes problemas. Además, para alcanzar el objetivo del turismo sostenible, este estudio analiza las iniciativas lanzadas por el gobierno como parte de la Misión de Turismo Digital de India destinadas a apoyar y revitalizar la industria turística del país. Se utilizaron datos primarios y secundarios en el estudio para identificar la importancia de la transformación digital en el sector turístico. Esta investigación demuestra las preocupaciones del turismo sostenible en el período pospandemia y destaca los enfoques resilientes adoptados por la muestra para abordar los problemas emergentes, utilizando el concepto de Cuádruple Línea de Base (*Quadruple Bottom Line*). También aborda cómo utilizan la tecnología digital para superar los desafíos de la industria y contribuir a la economía nacional. Además, resalta las diversas acciones que el gobierno indio ha implementado para introducir tecnologías digitales en apoyo al sector de viajes y turismo, con referencia específica a la Misión Nacional de Turismo Digital (NDTM), promoviendo un cambio de paradigma en favor del turismo digital para concretar el objetivo de viajes sostenibles y responsables.

Palabras clave: Política Nacional de Turismo; Gestión de Destinos Turísticos; Economía y Turismo; Turismo Sostenible y Digital; NDTM.

HOW TO CITE: Dhama, N. & Anil, K. (2024). Sustainable Tourism: A New Paradigm Shift in India's Travel and Tourism Industry. *Anais Brasileiros De Estudos Turísticos*, 14(Special Issue). Retrieved from: <https://periodicos.ufrb.br/index.php/abet/article/view/44097>
DOI: <https://doi.org/10.5281/zenodo.14577744>

1 INTRODUCTION

The global COVID-19 pandemic is having a significant negative impact on the travel industry. A disease outbreak exacerbated the global economic crisis, sparked international conflict, prevented travel, and changed social

relations. International conflict results in less trade and limited supply, which pushes up prices and resource hoarding. Conversely, a downturn in the economy causes businesses to fail, leading to a conflict of interest between employers and employees and job loss. 3.7 trillion Dollar lost in labor income (Forbes).



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The demand for tourism-related services has decreased further due to travel restrictions brought on by the pandemic and job losses. Additionally, it is claimed that social distance breeds mistrust among people and might result in prejudice and violence (Shih-Shuo Yeh, 2020). Nonetheless, digital tourism is considered a better option, and technology offers the travel sector more flexibility (Hall et al., 2020). According to the Economic Survey (2020–21) in 2018–19, The fact that tourism accounted for 5% of India's GDP and 13% of all jobs indicates how beneficial the industry is to the country's economy (Bhatia & Singh, 2024).

Because of the severe effects of the COVID-19 epidemic on the tourist sector, new strategies are needed to guarantee a long-term recovery (S. V. Kumar, 2021) and offer insightful information about the variables affecting employee retention in the hotel sector during the COVID-19 lockdown.

Organizations may ensure a resilient workforce and improve employee retention by emphasizing digital literacy, customized training, flexibility, e-HR systems, and CRM techniques. One strategy for improving digital infrastructure is to implement the Quadruple Bottom Line (QBL) framework, which expands on the Triple Bottom Line (TBL) by including health and well-being in addition to the economic, social, and environmental elements as a fourth pillar.

The interconnection of these aspects in attaining holistic sustainability makes this concept especially pertinent to the process of regaining consciousness after the epidemic. The pandemic brought about a number of notable changes for the travel and tourism sector, such as a move towards domestic travel, stricter health and safety regulations, and an emphasis on sustainability (UNWTO, 2024). The necessity for an all-encompassing structure such as the QBL to direct the sector's recuperation and subsequent expansion is highlighted by these modifications.

Further, The Indian Government has launched several initiatives to increase domestic and foreign travel (Bhatia & Singh, 2024). To maintain responsible and sustainable tourism practices Indian Government has also initiated the National Digital Tourism Mission (NDTM) to create a paradigm shift in the tourism industry of nation.

This study mainly discusses the various dynamic issues and resilient approaches to achieve sustainability in the tourism industry. Further, researcher elucidate the various schemes by the Indian Government and their implications with the help Indian tourism industry cases working in the area of digital tourism.

In the upcoming section, the researcher will discuss the dynamics and paradigm shift in the digital tourism Industry. Pre and post-pandemic dynamics have been discussed with the help of the model.

2 THE FOLLOWING ARE SOME OF THE MOST CRUCIAL AND URGENT POST-PANDEMIC TOURIST DYNAMICS ISSUES:

Increasing digitalisation. The organisation's technological infrastructure has been upgraded with audio-video conferencing technologies. Corporations have quickly embraced numerous technologies, such as cloud services, AI, and blockchain, to alter their industries.

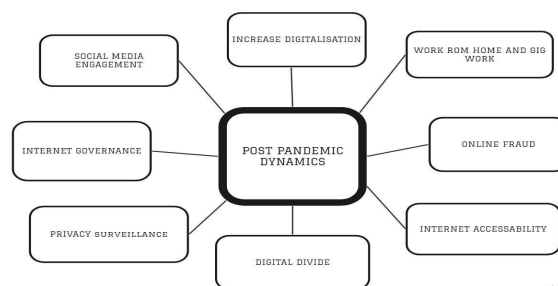


Figure 1. Post-pandemic dynamics.
Source: own elaboration.

Work from home and gig work. Job loss has increased significantly since the epidemic, and the need for social isolation has given place to a greater preference for working from home. But it has also increased the likelihood of technostress and presenteeism.

Working from home makes it simpler for employers to communicate directly with employees, even from far-flung places, while reducing workplace surveillance and technological stress. However, it leads to job overload, close supervision, and extreme anxiety.

Online fraud. As the world becomes more digital, online frauds, scams, and invasions increase in importance. Insecurity following the pandemic and a decline in faith in technology are rising.

Digital divide and Internet access. An internet connection is essential for survival during a pandemic. Therefore, a post-pandemic duty is to provide constant, secure, and quick internet connectivity.

Internet governance, net neutrality, and zero rating. The recent pandemic put tremendous pressure on the Internet's infrastructure, which raised the demand for data. India has an excellent track record in zero rating regulation. The Indian Telecom Regulatory Authority (TRAI) has decided to permit the remission of data usage fees during pandemics (COAI, 2020).

The Internet shutdowns are a worrying issue in a world where the Internet has become an integral part of people's lives and has significantly increased productivity. Governments worldwide have been supporting digital currency and payment systems even more vigorously during this outbreak.

Privacy and surveillance. Internet surveillance has become controversial, whether it is data from mobile apps or online student classes.

The global economy and employment are both significantly influenced by the tourism industry. Tourism is the main driver of economic growth in many nations. The tourism sector must thus relaunch with an emphasis on sustainability and begin with these new natural realities (Yung and Khoo-Lattimore, 2019). "The recommendations underline the need to move decisively, to restore confidence and, as UNWTO strengthens its cooperation with Google, to embrace innovation and the digital transformation of global tourism" (UNWTO, 2020, s/p).

Tourism service technologies cover the use of robots for automation, drastically improved or faster preparation, sensor-controlled processes, energy savings for labour, time, and materials, waste reduction, improved sanitation, reduced

bureaucratic service, and faster and more flexible service (OECD, 2005; Câmison & Montfort-Mir, 2012; Hjalager, 2010; Danielle J & Aires M & Costa C et al., n.d.).

A sustainable, safe, and effective tool for tourism revival is required. The moment has come to use this pandemic to reevaluate the tourism industry and move toward a sustainable future (Brouder, 2020). After the pandemic, it's time to employ novel strategies and eliminate anything that could undermine long-term goals (Ioannides & Gyimothy, 2020).

2.1 Technological resilience in tourism

In times of crisis or catastrophic emergencies, resilience serves as a crisis management tool for the business organization to maintain the stability and flexibility of all sorts of risks. It is a holistic skill that calls for cooperation, positive interpersonal connections, a wide range of crisis management approaches, and a vast network with the capacity. Technology gives the tourism industry flexibility (Hall et al., 2020).

Every segment of society benefits from technology without requiring direct physical assistance. Additionally, it has aided in dealing with COVID-19-related new age, identifying risks and opportunities to act quickly (Fitriasari, 2020, Alves, Lok Luo, Hao, 2020). Obligations, such as contract tracing and passenger screening and testing, with public confidence in technology is rising, and people are more willing to connect and ignore privacy concerns on benefits from technology (Stankov et al., 2020).

In this situation, Information and Communication Technology (ICT)-driven projects like Augmented Reality (AR) can contribute to tourism sustainability goals in addition to helping to improve the visitor experience (Cranmer et al., 2020). By superimposing computer-simulated contents like 3-D images, avatars, and interactive features onto the user's direct view through a multimedia device, Augmented Reality (AR) is an interactive experience that aids in exploring the real-world scenario (Cranmer et al., 2020; Kecke and Tomicic, 2017; Han et al., 2013).

The popularity of AR has grown in both the academic and industrial sectors, and it can help to replace tour guides who need to be more fluent in the local languages. AR not only offers the potential to restart safe and sustainable post-COVID-19 tourism significantly but is also regarded as one of the most significant breakthroughs of modern times (He et al., 2018, Chang et al., 2015). However, AR has received criticism for being overly expensive (Hassan and Rahimi, 2016; Tom Dieck et al., 2016). Therefore, it has a solution: as demand for AR and VR technology grows, so does manufacturing, which results in a lower cost and improved quality of this technique (Mora, 2020).

Technology fundamentally alters tourism (Gretzel et al., 2015). Travellers benefit from digital transformation both during and after their journey by sharing their experiences on various social media platforms, such as blogs and story updates. The process of mapping a visitor's entire journey is called the Tourism Customer Journey (TCJ), and it defines all the stages of experience that a tourist goes through as they learn about tourism (Aström, 2020).

After reading the reviews, we realized that this

increases demand and sparks interest in experiencing the joy of travel (Law et al., 2018; Sotiriadis, 2017). Additionally, digital transformation aids in taking corrective action from the offering side, including the tourism business, Government, etc., to generate practical tourism experiences, and feedback through social media platforms can provide a way to improve the services for travelers (Pencarelli, 2019).

To enhance information systems, users in the digital age, and advance Information and Communication Technology (ICT). It aids in minimizing the digital gap, a significant issue for the information society. Additionally, it is a nebulous and broad concept that applies to various circumstances (Rallet and Rochelander, 2004). Since it comes before and is more broadly accessible than access to and use of the Internet, access to basic telecommunications infrastructures is crucial to any study of the issue.

2.2 Digital Transformation Barriers

The digital ecosystem assists in removing barriers to tourism in addition to offering fresh, cutting-edge methods for its transformation. According to Gilovic et al. (2018), Michopoulou et al. (2000), and Nyanjom et al. (2018), the following obstacles exist:

- Informational obstacles are challenges in obtaining or gathering information about tourist attractions, food, drink, transportation, etc., in the form of buildings needing help navigating the metro system and getting between different sites. Political roadblocks and political agendas could harm tourists. Cultural barriers vary in how persons of various origins and talents behave. Barriers in relationships and interactions between people and tourists and technological hurdles that cutting-edge transportation and communication systems may impose on persons not accustomed to using them. Entrepreneurial Myopia needs to understand the scale and a fresh approach to bringing about change for travelers. Because of the tourism industry's emphasis on social connection, the sector faces significant hurdles despite these efforts, but there are also possible possibilities, such as the expansion of domestic travel and the emergence of digital nomads (Richards G and Morrill W, 2021).

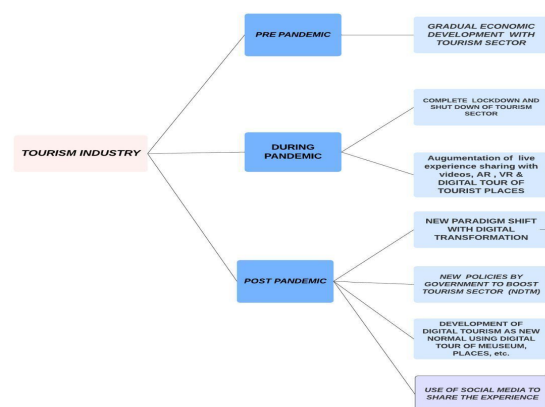


Figure 2. Tourism sector situation pre-, during and post-pandemic. Source: own elaboration.

As shown in Figure 2, the tourism business encountered many challenges before, during, and after the pandemic. Before the pandemic, the economy was overgrowing, attributable to specific innovative measures. However, everything was stopped during the pandemic, which caused the tourism sector to collapse. However, with AR and VR technologies and high social media engagement, many new horizons have opened up. To promote the tourist industry after the pandemic, the Indian Government launched the National Digital Tourism Mission, which resulted in a paradigm shift toward digital transformation.

2.3 Principles of Transforming Tourism

A less interconnected, complex, and uncertain world is the effect of a pandemic. It widens the gap between different nations and people. According to the United Nations World Tourism Organization (UNWTO), one in ten jobs is in the tourism industry, which employs a large and labour-intensive workforce. Thousands of jobs are in jeopardy in the severely impacted tourism sector.

However, it also fosters a bond, interdependence, and a sense of unity to combat the pandemic problem. It's time to look at the situation objectively; rather than focusing solely on the crisis's adverse effects, we must think creatively about creating a sustainable tourism industry to benefit tourism in the future.

As all nations have shared objectives, duties, and moral standards that can boost the tourism industry and bring about positive change, solidarity, trust, and solidarity are the most essential components in the fight against the pandemic.

Stakeholders in global governance must be aware of their obligations and responsibilities for sustainable tourism to succeed.

Multi-stakeholder involvement and balanced participation are required to attain shared global sustainability goals during times of crisis. Multi-stakeholders include political decision-makers, public entities, corporate entities, etc. The primary components for discussing the concept and exchanging expertise for improving the sustainable tourism sector are seminars, workshops, and focus group discussions.

Transparency is a crucial strategy for preserving trust amongst all parties involved and aids in determining the level of risk associated with specific policies. Positive stakeholder collaboration is a result of transparent communication.

Innovative thinking is required to rebuild sustainable tourism. Such as online investments that include virtual site tours. Developing fresh goods and solutions to tourism's problems. It involves online marketing strategies that encourage travellers to share their pleasant travel experiences, which contributes to the quick recovery of this industry (Carla Cardoso, 2020).

E-tourism has developed over the years as a subject of study and as an information technology theory (Xiang et al. 2021). Covid-19 has boosted the e-tourism industry because the pandemic has not significantly impacted it. Many previous and future travellers looked up tour experiences on social media during the lockdown.

They were occupied with posting old recollections on social media and considering future trips to their ideal

location. Many museums have opened their virtual doors to entice visitors who may otherwise become bored while confined. Crises drive the need for technological advancement and support of e-formative tourism aspects (Ulrike Gretzel, 2020).

2.4 Theoretical framework

Sustainable development, socioeconomic progress, and cultural preservation are all greatly aided by tourism. The COVID-19 pandemic, which impacted conventional tourism, is one example of the external shocks that the business is susceptible to. Virtual reality tourism (VRT) is becoming a novel alternative as nations reevaluate their approaches to tourism. Utilising state-of-the-art technology, VRT minimises the need for actual travel by enabling users to virtually visit areas. There is a chance to incorporate sustainable concepts into the tourist industry (Korkut & Surer, 2023).

Technologies like Augmented Reality (AR) and Virtual Reality (VR)(Scavarelli et al., 2021) are becoming more and more common in many industries, including travel. Though there are many conversations concerning their possible uses, there is still a dearth of comprehensive information on VR and AR in tourism.

The tourist and hospitality sectors have witnessed a rise in the use of Virtual Reality (VR) and Augmented Reality (AR) technology, which provide creative solutions in a range of settings. (Chen et al., 2023; Yung & Khoo-Lattimore, 2019) VR and AR are effective tools in destination marketing that raise awareness and increase tourist engagement. However, issues with usability and variety in terminology continue to exist.

These technologies have been effectively incorporated into tourist education courses, which has motivated students and improved learning outcomes. However, time commitment and technical literacy continue to be barriers. AR applications at museums and historical places offer interactive information to improve the tourist experience, but difficulties with usability and authenticity need to be resolved.

Additionally, VR and AR have been investigated for food safety training and recreating controlled scenarios in the Food & Beverage (F&B) industry and Meetings, Incentives, Conferences, and Exhibitions (MICE). In the MICE sector, virtual events provide options to in-person travel, creating new frontiers for discovery (Lu et al., 2024; Su et al., 2024).

2.5 Quadruple bottom line theory

According to the Triple Bottom Line (TBL) theory, businesses should take social and environmental sustainability into account in addition to economic sustainability (Stoddard et al., 2012). The Quadruple Bottom Line (QBL), having "purpose" as fourth dimension includes health and well-being as a fourth pillar in addition to the economy, society, and environment, is an extension of the Triple Bottom Line (TBL) in the context of virtual tourism (Purcell & Nikolova, n.d.-a).

The QBL framework, which emphasises healthy people, a healthy planet, and enhanced prosperity for everyone, is in line with the UN's goal of a future where no one is left behind. Digital transformation (Zhang & Wang,

2021) in tourism industry could help in achieving the fourth pillar in an efficient manner by offering several advantages, such as:

1. Diminished Ecological Effect: Vehicle-to-travel (VRT) offsets the carbon footprint linked to tangible transportation, particularly air travel. Urbanisation and tourism can be minimised to help preserve delicate ecosystems (Yang et al., 2022).

2. Cultural Treasures Preservation: Virtual Reality Technology (VRT) enables the digitalization of natural and cultural treasures. Global access to high-fidelity reproductions of artefacts and sites captivates viewers with immersive experiences (Siddiqui et al., n.d.).

3. Economic Resilience: In the event of travel limitations, VRT offers the tourist sector a backup source of income. Visually exhibiting famous landmarks and cultural locations boosts local economies even with little tourism. (Korkut & Surer, 2023)

Further, ecological presence (Su et al., 2024) can help to understand tourist perspective virtually. "ecological presence" describes how visitors feel genuine and fully immersed in virtual ecological settings. It significantly impacts personal standards, environmental self-identity, and biospheric values. Increased ecological presence acts as a mediator between environmental self-identity and biospheric values to indirectly support TERB.

TERB refers to travellers' dedication to eco-friendly behaviours. Self-efficacy and self-image with the environment are vital for developing ecological consciousness. With its immersive experiences, virtual reality (VRT) may promote environmentally responsible behavior by fostering sustainable behaviors (Chen et al., 2023; Korkut & Surer, 2023; Scavarelli et al., 2021; Yung & Khoo-Lattimore, 2019).

2.6 Sustainable and Technological Transformation

It is generally known and evident that technological advancements alone cannot eliminate all obstacles, but they can make a significant dent in them. Universities and research institutions should be heavily involved in the change with the Government's aid. Developing a better digital ecosystem may facilitate the spread of information among people.

Additionally, communities might establish various authorities to assist visitors in finding answers to their travel-related questions and lessen the mobility of barriers. The potential to support a holistic tourism industry can be created via technological infrastructure (Fabio Cassia et al., 2020).

A crucial tool for the development of creative culture, tourism is changing at an ever-increasing rate. It aids the traveller in reinventing both their inner and outer worlds of tourism. As customers, business owners, producers, and travellers, it develops a new way of understanding the world and their inner selves. This helps to change and regenerate a new tourism paradigm for a better economic system. The worldwide tourism industry is reset by transformation for more positive developments (Irena Ateljevic, 2020).

The 2016 Transformative Travel Council (TTC) is a group of experts who support improved life change and maximizing the benefits of sound travel. Travel that transform

is the next evolution. Digital innovations and growing social media usage, where travelers share their experiences and influence others, drive this shift in the tourism sector (Fuentes-Moraleda et al., 2016).

According to a Vogue magazine article, travel is inspired and defined by a change in viewpoint, self-reflection, development, and a closer connection to nature and culture (Trimble, 2017). How a tourist guide may create a tourism experience so that the visitor can arrive at the destination of an inner-world journey and how a human journey can be a connection of serenity and a sense of unity in travel (Sheldon, 2020).

We can normalize increased levels of separation and control, think that they are required to keep us secure, and accept a world in which we are scared to be close to each other, according to Eisenstein (2020). Or we might seize this stop, this break from routine, to embark on a path of reunification, holism, the mending of community, the inclusion of the web of life, and the re-establishment of lost links.

Due to its rich cultural diversity, traditions, and past, Indian tourism holds a distinct place in the world. The Indian Ministry of Tourism has launched an attempt to promote Indian tourism in the online market and boost customer engagement with the help of virtual tour ideas. Through its Nodal organisation, the India Tourism Development Council (ITDC), the Ministry has started the process.

To select a private agency to conceptualise, develop, design, update, and maintain the digital platforms of the tourism industry, they have already released an electronic tender. The planned platform aims to connect, involve, and educate the travel industry in various fields while showcasing India's potential as a top travel destination in the world for leisure, medical tourism, adventure, wildlife, heritage, rural experience, etc. In addition, the Government is open to suggestions for platforms that can offer services like virtual tours of locations, landmarks, and experiences in India with a predetermined travel structure.

The Government has also researched many effective current models that are adopted by numerous tourism boards abroad. On National Start-up Day 2022, Rajasthan Studio proposed the notion of Travel Experiences Identification Tags and Road Trip Definition. The concept will encourage virtual travel, allowing individuals to experience popular Indian tourist spots digitally. The Government routinely launches new programs to boost Indian culture and tourism.

Numerous programs are planned to help, including spiritual tourism, wellness tourism, yoga, and digital connectivity. Recent developments include the Kedarnath Dham Corridor, the new temple foundation at the Somnath Temple Complex, and the Vishwanath Corridor Development in Varanasi. The Government is also improving connectivity between the Buddhist and Ramayan circuits.

2.7 Different Initiatives by the Government of India to Promote Tourism to Enhance the Tourism Sector

The five Ts — **Talent, Tradition, Tourism, Trade, and Technology** are the foundation on which the prime minister has concentrated on building the "*Brand India*". With the support of the five Ts, various ministries are working at

various levels to build the brand India. The Ministry of tourism is one of these ministries and has developed various plans and strategies. The following plan of the Ministry of Tourism aims to grow the travel and tourism sector and, ultimately, the country's overall social and economic value.

The following primary goals of the Government of India's Digital Mission on Tourism have been established: (i). To make the country's tourism industry more competitive (ii). The development of smart places using digital technology (iii). To shift corporate concepts and procedures digitally (iv). Fostering market growth through digital transformation (v). Assisting MSMEs in implementing digital technology (vi). To encourage the use of digital skills in the workforce.

The life cycle of a tourist trip has also been designed, and it is separated into three parts: the pre-holiday time, the holiday period, and the post-holiday period. It consists of several stages, beginning with information on the:

1. Travel destination, budget, and other factors.
2. Consult and choose your journey itinerary, books, and other options.
3. Lodging and transportation.
4. Recreation and pastimes.
5. Following a trip, activities.

The following are the main tenets of the strategy to expand India's tourism industry:

- (i) Ecosystem Analysis, all digital initiatives must be planned as ecosystems that span the federal Government, individual states, and the private and public sectors and comprise some independent, cooperative systems. Encourage end-user, ecosystem, and participatory design engagement across the digital effort.
- (ii) Using building blocks: Create systems and ecosystems using basic, reusable building blocks that can be grouped into Core, Common, and Reference Building Blocks. These building blocks should be loosely connected and able to be combined. To guarantee service levels for all stakeholders, ecosystem members should establish quality control procedures and develop promise-based interrelationships.
- (iii) To guarantee service levels for all stakeholders, ecosystem members should establish quality control procedures and develop promise-based interrelationships.
- (iv) Use a Federated Architecture design approach to create digital ecosystems based on the concepts of a single source of truth and a system of records. Although a central system can hasten adoption, it should be an option, and it is essential to provide interoperability across numerous federated systems through shared specifications.
- (v) Foster interoperability by using and/or creating open standards, licenses, databases, and APIs. It fosters competition, realises cross-platform efficiency, and protects against possible monopolies of unjust value capture.
- (vi) Resilience, as there should be no single point of failure in the pooled orchestration of the building pieces. Services must be designed with automated

recovery and adaptation mechanisms to resist failures. Similarly to this, every process needs to be flexible and re-adaptable to tolerate interruptions.

Building blocks must be simple (both data and functional), atomic, and generic to enable solution architects to "reuse and extend" these to create contextual and scalable solutions, avoiding reinventing the wheel. A minimum feasible architecture based on microservices, minimal documentation, agile acquisition, and regulation should all be used to implement the minimalistic paradigm.

(viii). Innovation with "responsible" implementation of developing technology by catalyzing, energizing, and supporting the NDTM.

States have also created travel websites and mobile applications to promote tourist destinations, travel advisors, lodging options, and adventure activities. For example, the Incredible India app, the Tourist Guide app, etc. All significant tourism actors and attractions should be geo-mapped, which increases the number of options for communication with other tourism-related players thanks to flexible and dynamic rate cards.

The Unified tourist interface layers shall make data and information interchange possible. Among the many ecosystem services and actors. The information suppliers and information consumers may alter depending on the use case.

Second, identifying areas where Distributed Ledger Technology (blockchain) could be used to facilitate hassle-free travel, such as issuing E-visas and identifying incoming travellers from around the world. Following client approval, this information can be made available to different parties. The services layer, developed on top of the data layer and will enable numerous applications and systems, will make up the third layer of the tourism interface. The NDTM will encourage its actors to deploy their Application Programming Interfaces (API) and microservices as open APIs under its API definitions, protocols, and standards.

After considering the obstacles, goals, and list of building blocks developed in the National Stack for Tourists, which can significantly impact the tourism sector, NDTM plans to implement quick wins. It would involve some influential parties who would also support India's plan for its digital tourism industry.

Social media, skilling portals, GIS (Geographic Information System)-based route planning, data sharing protocols, data analytics, e-tourism platforms, single window compliance, one nation, any ticket, grievance management, etc., are all included.

3 RESEARCH CONTEXT AND SAMPLE COLLECTION

For the study's objective, secondary data was gathered from historical materials such as Government websites, newspapers, social media accounts, press releases, reports, and other documents. The semi-structured expert interviews conducted both online and offline provided vital data. A thorough, semi-structured interview guide was created, including two sections, open-ended and targeted questions, and a second part of the interview questions that were required to get the topic started (Fig. 3).

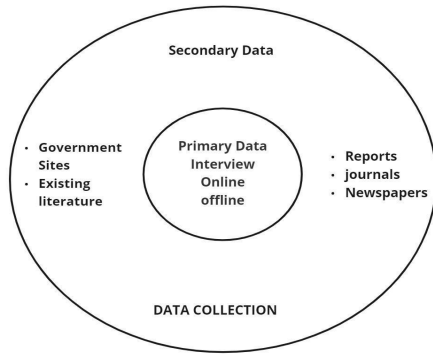


Figure 3. Data collection methods.
 Source: own elaboration.

It included inquiries on five different themes. Each online interview lasted about 40 minutes, and some received follow-up interviews. Many sources of data collection are from experts in the tourist industry. They were all leaders in the tourism industry at the time. The contribution and assistance for the tourism sector were covered by a total of a few questions.

Based on the information gathered through interview data, five themes have emerged. In the Given table (Table 1), Experts profile have been discussed, where experts and their companies have been mentioned as pseudo names respectively to maintain the ethical concerns. It also depicts the awareness of the NDTM in the Indian tourism industry.

Table 1. Profile Details and awareness of NDTM.

Name	Profile	Companies name (Pseudo Names of the sample)	Awareness about NDTM (National Digital Tourism Mission)	Are you taking any Government scheme support	Does NDTM aid your business
ET 1	Founder	C1	Yes	No	Maybe
ET 2	CEO	C2	yes, yes, but unaware of details of it	No	No
ET 3	Senior Manager Business Development, Payment Network Industry	C3	yes but unaware about details of it	No	Maybe
ET 4	Co-Founder	C4	Yes	No	Yes, In the form of Cross-Domain Generic Building Blocks, Tourism Domain Data, Unified Tourism Interface, User Systems
ET 5	Team Leader	C5	Yes	No	No
ET 6	Community Manager	C6	No	No	No

ET- Experts of Tourism Enterprises; C- Companies Name Code; NDTM- National Digital Tourism Mission.
 Source: own elaboration.

3.1 Analysis and Findings

This study assisted in determining the post-pandemic state of the tourism business.

We were able to assess the issue during the pandemic with the aid of interviews we conducted with experts in the tourism sector or owners of tourism businesses. Results demonstrate how this pandemic sparked or caused the emergence of the digital transformation in the tourism industry and how it became a source of resilience and a paradigm shift that gave the industry a better shape and eventually enabled it to achieve the goal of sustainability. Seven specialists gave their opinions and personal experiences from the epidemic period.

Various themes were developed based on their interview responses (Fig.4). In the further section, the researcher would discuss the themes generated and the different orientations of the experts, followed by the finding section based on the discussion with the experts of the Indian tourism industry.

Further themes also clustered based on the quadruple bottom line. Innovative frameworks are required to enable

sustained recovery and growth in the tourist business, which has been fundamentally changed by the COVID-19 epidemic. A comprehensive strategy for tackling the many potential difficulties in the post-pandemic age is provided by the Quadruple Bottom Line (QBL) framework, which builds on the Triple Bottom Line (TBL) by including health and well-being as a fourth pillar.

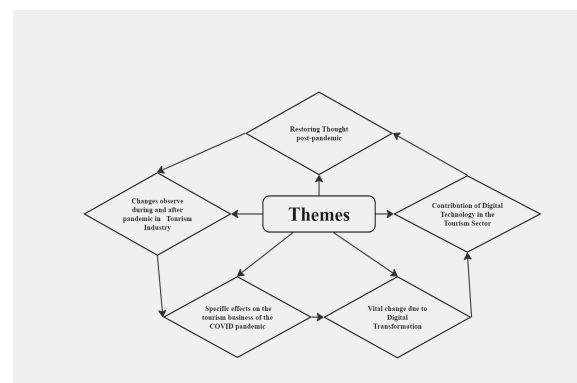


Figure 4. Themes based on interviews.
 Source: own elaboration.

Table 2. Theme- restoring thought post-pandemic.

THEME 1	Restoring Thought post-pandemic
Travel Expert	
Analysis	Countries whose economies rely heavily on tourism will probably be affected by the downturn for much longer than others. Contact-intensive services, vital to the travel and tourism industries, are disproportionately impacted by the epidemic and will likely remain so until people feel secure enough to travel in large numbers once more.

ET 1	<i>Uncertain yet, we cannot say anything about the coming future situations.</i>
ET 2	<i>Since late 2021, Travel has begun again. Although the engagement was low people started with the Revenge travel mode. Domestically, travel has increased but International travel is yet to pick up. 2022 has been a good beginning post-pandemic. We as a company have been receiving alot of queries for the same wishing to travel in December.</i>
ET 3	<i>It has been a pent-up industry, and the growth has been seen by everyone</i>
ET 4	<i>According to the United Nations World Tourism Organization (UNWTO), tourist arrivals are estimated to have fallen 74 percent in 2020 compared to 2019. Post-pandemic, the world is moving towards ecotourism. Technology will play an important role. With social distancing and health and hygiene protocols likely to remain in place, touchless service delivery and investments in digital technology could be a bridge to recovery. Countries should focus more on increasing domestic travel and increasing weekends so that people can travel.</i>
ET 5	<i>it is Booming now with gradual speed</i>
ET 6	<i>The way ahead is sustainable management.</i>
ET 7	<i>Industries became mature and were able to develop their latent potential and explore the world beyond the social world.</i>

Source: own elaboration.

Post-pandemic thoughts are included in Theme 1, which talks about the different perspectives of experts on post-pandemic scenarios in the tourism industry, some experts expect gradual improvement, and some are still afraid of an uncertain atmosphere; sustainable management

is also expected experts in terms of increasing the domestic and international travels. Sustainable activities are very much expected by the tourism industry as people also want to travel and explore the outer social world with responsible behavior.

Table 3. Changes observed during and after the pandemic in the Tourism Industry.

THEME 2 Experts	Changes observe during and after pandemic in Tourism Industry.
Analysis	In the first half of this year, tourist arrivals fell globally by more than 65 per cent, with a near halt since April—compared with 8 per cent during the global financial crisis and 17 per cent amid the SARS epidemic of 2003, according to ongoing IMF research on tourism in a post-pandemic world.
ET 1	<i>The travel industry almost died during the pandemic, and it is still bleeding with the pain in its heart and muscles.</i>
ET 2	<i>During the Pandemic, the Travel industry had a terrible impact. A few of my friends from the industry had faced financial hardship to keep their companies afloat. With lots of cancellations and refunds, it was tough to keep up. Many companies without solid financial assistance had to discontinue their businesses. Post-pandemic things are yet to be determined. Domestic travel is good. Corporate travel, the significant contribution to the industry, had been shallow.</i>
ET 3	<i>The global pandemic has put 100 million jobs at risk, many in micro, small, and medium-sized enterprises. Tourism receipts worldwide are not expected to recover to 2019 levels until 2023. As per the research done by World Economic Outlook, the real GDP among African countries dependent on tourism shrinks by 12 per cent. Among tourism-dependent Caribbean nations, the decline was 12 per cent. Pacific island nations such as Fiji saw real GDP shrink by 21 per cent in 2020. The World Tourism and Travel Council, in a report on the industry's future, said the pandemic had shifted travellers' focus to domestic trips or nature and outdoor destinations. Travel will essentially be "kick-started by the less risk-averse travellers and early adopters, from adventure travellers and backpackers to surfers and mountain climbers.</i>
ET 4	<i>The demand reduction was very prominent during the pandemic.</i>
ET 6	<i>The emerging role of technology in defining the tourism industry.</i>
ET 7	<i>During the pandemic our business almost died, which started its respiration again with the hope of progress in the pandemic era. Different dimensions of business models in the tourism sector have developed post-pandemic, such as experiential tourism in village areas apart from highly populated cities and malls.</i>

Source: own elaboration.

Theme 2 discussed the Changes observed during and after the pandemic in the Tourism Industry.

Experts have observed a large number of changes in the tourism industry in terms of social and physical factors, as people want to get out of their homes for better

experiences, but at the same time, they are also facing some social and mental pressure of getting affected with the pandemic. For that, they have opted for the more village tours where there are less number of people and less crowd as compared to cities and big malls in metropolitan cities.

Table 4. Specific effects on tourism business of COVID pandemic.

THEME 3 Travel Experts	Specific effects on the tourism business of the COVID pandemic.
Analysis	World Travel and Tourism Council (WTTTC, 2020) predicted 100.8 million job losses in the tourism sector due to the Covid-19 pandemic, which is 31% of the total jobs in this sector. This industry generated 10.3% of the global economy's GDP, which is expected to reduce by 31% (WTTTC, 2020; Benvenuto et al., 2020).
ET 1	<i>Due to Covid 19 it went from 99 to 0 in all aspects of the travel business, either jobs or revenue.</i>
ET 2	<i>We had to face a lot of loss due to refunds made to the customers. An advance payment from partners was not refunded to us. I lost lots of clients and am still recovering from the loss.</i>
ET 3	<i>During the Pandemic, the tourism industry had come to a halt, and even if there was any travel, it was obligated. Post-pandemic travel has gone up, but with some restrictions, people are more cautious before travelling.</i>
ET 4	<i>There are several effects, such as: 1. Contract Lost 2. Revenue Drop 3. Clients and Customers are not willing to offer travel products 4. Difficult in sustaining in the market.</i>
ET 5	<i>Reductions in the number of queries for travel outside India.</i>
ET 6	<i>It provided us with an opportunity to address the destination and business management challenges.</i>

ET 7	<i>Complete stuck down the revenue and business at a large, demand went to almost nil during Covid.</i>
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Source: own elaboration.

Theme 3 has included the Specific effects on the tourism business of the COVID pandemic. Tourism Industry has evident a large number of job loss as mentioned by UNWTO and different Government reports mentioned by one of the respondents, tourism industry was just dead for that period, significant loss in terms of revenue, cancellation of tours, high number of refunds has been observed

domestically as well as in international tours, which affected very badly the tourism industry and majorly the small travel companies, responsible and sustainable tourism practices could be the better substitute to battle with upcoming uncertainties in future with special emphasis on tourism industry.

Table 5. Vital Change Due to Digital Transformation.

THEME 4	Vital change due to Digital Transformation
Expert view	
Analysis	Digital transformation is the process by which companies embed technologies across their businesses to drive fundamental change. The vital changes are in the form of Increased efficiency, greater business agility and, ultimately, the unlocking of new value for employees, customers and shareholders.
ET 1	<i>It has always contributed to the company's beliefs as it is a zero-paper company, and our operations were always digital.</i>
ET 2	<i>Yes, as an information part. Travellers are aware of the details with the help of digital technology.</i>
ET 3	<i>Less billing and overseas transactions have been observed with the help of digital transformation in the travel industry.</i>
ET 4	<i>Yes. Digital Transformation not only does it result in saving loads of time and optimising overall organisational productivity, but it also makes sure that your business stays ahead of the competition in the long run. Using technologies such as the 'Internet of Things,' location-based services, artificial intelligence, augmented and virtual reality, and blockchain technology has resulted in a more appealing, efficient, inclusive, and economically, socially, and environmentally sustainable tourism offer than before. It has also helped in providing travellers with optimal destinations by implementing technologies that can detect seasonal and situational influences in specific tourist locations, also known as intelligent destinations. A unified smart travel model that encompasses smart visas, borders, security processes, and infrastructure will revolutionise tourism in the same way that the smartphone transformed telecommunications and media.</i>
ET 5	<i>Yes, digital solution is the next best alternative</i>
ET 6	<i>Yes, it helps monitor the trajectory of development.</i>
ET 7	<i>Yes, the tourist industry has started working toward digital technology at a great pace post-pandemic as almost every customer is available online to avail the pre and post-tour services.</i>

Source: own elaboration.

Theme 4 discusses the Vital change due to Digital Transformation. The tourism industry at the global level has realized the importance of digital tourism, which includes virtual tours of museums and different tourist sites, which not only physically but virtually help the tourist to experience the journey without going out of their homes.

paperwork and instant booking and cancellation of the tours instead of lengthy documentation and further formalities before the tours. Social media has also been seen as the major segment that propels experiential tours all over the world. People have experienced so many sites without moving physically.

Further, it helps in creating sustainable tourism in the perspective of the environment, where it requires less

Table 6. Contribution of Digital Technology in the tourism Sector.

THEME 5	Contribution of Digital Technology in the Tourism Sector.
Travel Experts	
Expert View	It helps track and streamline processes, maintain data flow and manage contacts and employee records. This increased efficiency in operation helps reduce costs and enables the business to multiply.
ET 1	<i>Digital transformation is beneficial in multiple aspects; however, the industry needs to be trained for the same as there are a lot of people working on multiple levels, such as guides, drivers, local agents, etc., that are getting impacted by it. This digitalisation is costing a lot of people their employment as well as opening new aspects for better and systematic work opportunities.</i>
ET 2	<i>Digital transformation aid in the form of visibility of the business across the world wide without much effort.</i>
ET 3	<i>Indeed, it comes with more convenience and ease of doing transactions in the business and ease in performing the other functions and business as a whole.</i>
ET 4	<i>Contribution can be seen in many ways such as: 1. Smart Travel for Better Experience 2. Customer Friendly 3. Smart Destinations 4. Online Reservations 5. Online Visa 6. Online Communities and more.</i>
ET 5	<i>Having toolkits designed for tourism stakeholders like START to help them in their sustainability journey.</i>
ET 7	<i>The Digital sector comes as a paradigm change in the conventional way of availability of services irrespective of the sector. The tourism sector is one of them. Now it is easy to assist the tourist throughout their journey to make their tour successful.</i>

Source: own elaboration.

Theme 5 deals with the Contribution of Digital Technology in the Tourism Sector. Digital tourism has seen as the best alternative during and after the pandemic. It further helped the Governments to create different policies to

promote the substitutes named as virtual tours with the help of augmented and virtual reality. NDTM is one of the examples of the policies by the Indian Government. Which is also evident as a major factor of sustainable tourism.

The tourist industry was severely damaged by the COVID-19 epidemic, which resulted in monetary losses, company closures, and job losses. It is crucial to comprehend these economic impacts to create policies that improve recovery and resilience. Social equity gained prominence as the sector moved towards domestic travel and concentrated on local communities. It became more critical, underscoring the importance of equitable distribution of tourist benefits for sustainable development.

By reducing the need for physical travel and conserving natural resources, digital transformation—which includes virtual and augmented reality—has helped to promote environmental sustainability by cutting carbon emissions. The pandemic also made clear how crucial it is to put health and well-being first in tourist initiatives to foster healing and restore confidence. Digital technologies have played a pivotal role in preserving connection and offering secure substitutes for physical transportation, augmenting general welfare.

The study explores how QBL can be clustered and aligned with key themes (Fig.5).

1. Restoring thought post-pandemic: The epidemic has highlighted the interdependence of health, the economy, society, and the environment. Rethinking tourist tactics to prioritize holistic well-being is part of regaining perspective after the epidemic. The QBL framework highlights the significance of social, economic, and environmental factors in addition to health and well-being.

This strategy ensures that initiatives to revive the tourist industry also prioritize improving people's and communities' physical and emotional well-being. Tourism enterprises may develop more resilient and sustainable models that meet the changing demands of travellers in a post-pandemic world by including health and well-being in their plans (Purcell & Nikolova, n.d.-a).

2. Changes Observed During and After the Pandemic in the Tourism Industry: Due to constraints on foreign travel, the pandemic has caused substantial changes in the patterns of tourism, with a significant increase in domestic and local tourism. This change has brought to light the necessity for tourism-related enterprises to adjust to the evolving tastes and habits of their clientele. By encouraging sustainable behaviours that balance economic viability, social equality, and environmental responsibility, the QBL framework aids in this adaptation. For instance, on regional tourism may boost local economies and lessen the harmful effects of long-distance travel on the environment. Furthermore, emphasizing health and well-being guarantees that tourist services are created to give visitors safe and fulfilling experiences.

3. Specific Effects on the Tourism Business of the COVID Pandemic: Significant financial losses, the closure of travel agencies, and widespread unemployment are only a few of the negative consequences the COVID-19 epidemic has had on the tourist industry. To solve these issues, the QBL framework promotes policies that foster social justice, environmental sustainability, and economic resilience. Tourism firms can restore trust with travellers and establish safer, more welcoming settings by putting health and well-being first. This strategy not only helps lessen the

pandemic's immediate effects but also establishes the groundwork for sustainability and expansion over the long run.

4. Vital Change Due to Digital Transformation: The digital revolution is one of the most critical factors in the tourist industry's adjustment to the new normal. Digital technology integration, including augmented reality (AR), virtual reality (VR), and artificial intelligence (AI), has completely changed how travel agencies run and interact with clients (Korkut & Surer, 2023). By decreasing the need for actual travel, these technologies have improved the accessibility and effectiveness of tourist services while also promoting environmental sustainability (UNWTO). To ensure that technology improvements align with the principles of economic viability, social equality, environmental responsibility, and health and well-being, the QBL framework promotes the ongoing adoption of digital solutions (Purcell & Nikolova, n.d.).

5. Contribution of Digital Technology in the Tourism Sector: The tourist industry has significantly benefited from the resilience and creativity of digital technology. More appealing, effective, and sustainable travel options have been made possible by applying technologies like blockchain, location-based services, and the Internet of Things (IoT)(UNWTO, 2024). These developments have made it easier to create intelligent destinations and improved the journey experience in general. A balanced strategy that benefits the tourist sector and society at large may be created by using the QBL framework to ensure that digital transformation initiatives align with more general sustainability objectives.

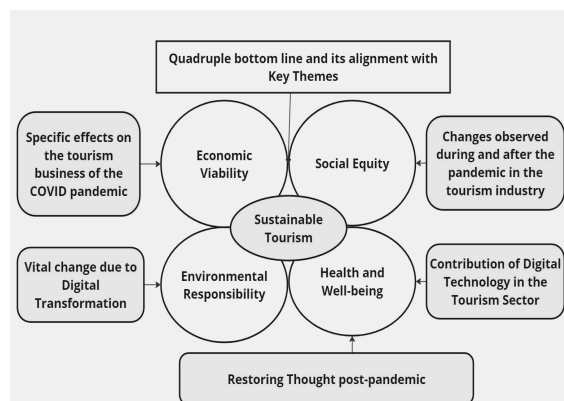


Figure 5. Alignment of quadruple bottom line and key themes.
 Source: own elaboration.

4 CONCLUSION

With this paradigm shift toward digital tourism, the goal of sustainable tourism would be achieved, and it would also be in line with the 2030 Agenda and the SDGs. preserving biodiversity and using land sustainably. The offered indepth analyses and opinions of the tourism industry specialists make it simple to understand the importance of digitalisation.

The goal of sustainable tourism can only be attained with the help of digital transformation. The structure of the Quadruple Bottom Line offers a strong basis for tackling the intricate problems and prospects in the tourist sector following the epidemic.

The QBL framework facilitates the creation of resilient and sustainable tourism models that can adjust to shifting consumer tastes and worldwide trends by combining economic, social, environmental, and health aspects. The efficiency of water and energy uses waste reduction and greenhouse gas emissions.

Enhance the competitiveness of the tourism sector and attract private sector investment in addition to helping to preserve and improve the cultural and natural resources of the nation and eventually contribute to the Indian economy by increasing visitation, stay, and spending, creating jobs and entrepreneurial opportunities in the tourism sector and ensuring the supply of skilled labor.

The pandemic assisted us in understanding the role of the digital era and how it could improve the integration of local businesses in the nation's tourism value chain as well as the development of digitalisation and the explosion of smart destinations, an approach to competitiveness, sustainability, and governance that could contribute to the nations GDP in the form of employment and investment flourish of small businesses.

Further we need to understand the legal issues raised by emerging trends in digital tourism. Given the rapid evolution of this sector, legal frameworks must keep up with technological developments to guarantee fair corporate practices and consumer protection (Pacheco Jiménez, 2023).

This research analysed the issues faced by the sustainable tourism industry both during and after the pandemic and how they came up with various innovative solutions to these issues through digital means. However, this research could only cover seven experts from the sustainable tourism industry and hence could be considered a limiting factor.

A more robust analysis can be expected by increasing the study sample. Another limitation of the study is that the policy for NDTM has recently been announced. So, it's an early step to do its impact assessment. Future research could emphasize the impact of the national digital tourism mission and how far they can achieve their objectives. Additionally, we must examine the implications of the Quadruple bottom line in more detail in subsequent future studies.

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CRedit author statement.

Term	Definition	Author 1	A2
Conceptualization	Ideas; formulation or evolution of overarching research goals and aims	x	x
Methodology	Development or design of methodology; creation of models	x	
Software	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components	x	
Validation	Verification, whether as a part of the activity or separate, of the overall replication/ reproducibility of results/experiments and other research outputs		x
Formal analysis	Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data	x	
Investigation	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection	x	
Resources	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools	x	
Data Curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse		x
Writing - Original Draft	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation)	x	
Writing - Review & Editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages	x	x
Visualization	Preparation, creation and/or presentation of the published work, specifically visualization/ data presentation	x	
Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team		x
Project administration	Management and coordination responsibility for the research activity planning and execution	x	x
Funding acquisition	Acquisition of the financial support for the project leading to this publication	x	

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Processo Editorial / Editorial Process / Proceso Editorial

Editor Chefe / Editor-in-chief / Editor Jefe: PhD Thiago D. Pimentel (UFJF).

Recebido / Received / Recibido: 05.04.2024; Revisado / Revised / Revisado: 01.05.2024 – 25.06.2024 – 30.11.2024; Aprovado / Approved / Apobado: 15.12.2024; Publicado / Published / Publicado: 30.12.2024.

Documento revisado às cegas por pares / Double-blind peer review paper / Documento revisado por pares ciegos.