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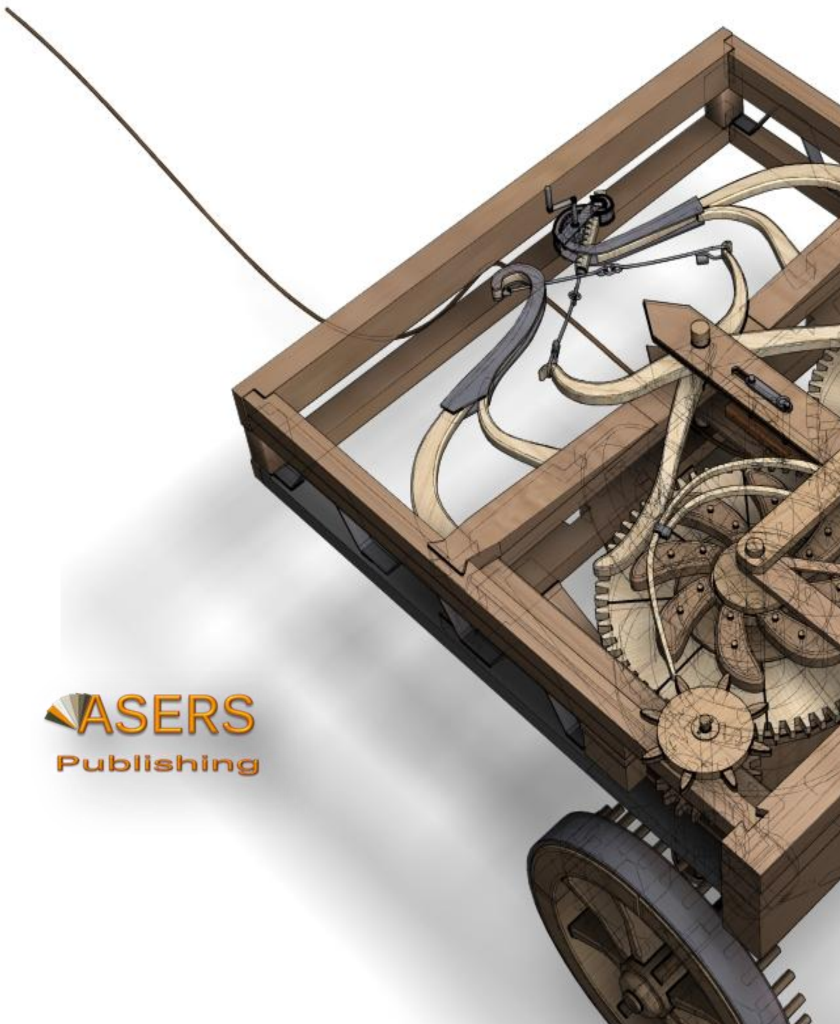

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Understanding Human Perception of Artificial Light at Night and Preferred Lighting Conditions in Parks and Protected Areas: A Pilot Study

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Abstract: Naturally dark environments are increasingly threatened by artificial light at night (ALAN), even in parks and protected areas (PPAs). This study explores visitor preferences for lighting spectra and intensity in front-country, PPA-like settings to better understand how to balance human lighting needs with the protection of ecological and cultural resources. An onsite survey was conducted at a university arboretum in the United States (n = 167). Participants were asked to select preferred lighting conditions (color and intensity) using bollard fixtures with adjustable amber and white LEDs. Statistical analyses examined spectra and intensity preferences as well as demographic influences (gender, youth environment, nighttime recreation experience). Results indicate a significant preference for amber light (67%) over white light (33%). On average, participants preferred amber light at lower intensities (2.87 lux) compared to white light (5.18 lux). Prior nighttime recreation experience was associated with lower preferred light intensity and stronger selection of amber light. Participants from rural and suburban backgrounds were more likely to choose amber, while urban-raised participants showed no clear preference and tended toward higher intensities when selecting white light. This pilot study is one of the first to experimentally examine visitor lighting preferences in relation to both spectra and intensity in a PPA-like setting. Findings challenge assumptions based on industry standards, which often recommend higher light levels, and provide context-sensitive guidance for PPA lighting management. The sample consisted largely of university students, limiting age diversity and generalizability. Future research across broader populations and within actual PPAs is needed to validate results. Findings suggest that lower-intensity amber lighting can meet visitor needs while minimizing ecological impacts, offering managers evidence-based strategies for sustainable lighting design in PPAs. By aligning visitor preferences with conservation goals, PPA managers can protect naturally dark skies while maintaining visitor safety and experience, supporting the rise of noctourism - nighttime recreation and tourism that values darkness as a resource - and reinforcing the cultural and ecological significance of darkness as a shared resource.

Keywords: artificial light at night; light pollution; parks; protected areas; visitor experience; visitor preference.

JEL Classification: Q52; Q56; Q57.

Introduction

Throughout human history, the stars of the night sky have been a muse for sonnets and songs, a foundation of religions and cultures, and a natural map guiding exploration. Yet, rising levels of artificial lighting have dulled the visibility and beauty of the night. Artificial light at night (ALAN) - such as streetlights, building illumination, and outdoor lighting - is a form of anthropogenic light that alters natural night light cycles (Klinkenborg, 2008). When nighttime lighting is excessive, misdirected, or spills into unintended areas, it becomes light pollution (Gallaway *et al.* 2010; Bennie *et al.* 2015). Common manifestations include skyglow, light trespass, and glare (Bullough *et al.* 2008). Light pollution continues to grow globally and increasingly encroaches upon natural and cultural resource areas, including national parks and wilderness areas (Kyba *et al.* 2023). Even within parks and protected areas (PPAs), lighting is often installed to facilitate nighttime visitor use for navigation and safety.

Light pollution poses risks for both ecological and experiential dimensions of PPAs. Many protected areas are particularly sensitive due to their ecological value and the opportunities they provide for solitude and stargazing - experiences that depend on natural darkness (Albers & Duriscoe, 2001; Duriscoe, 2001). High levels of ALAN near or within these areas threaten not only ecological systems but also cultural and aesthetic resources (Aubrecht *et al.* 2010). Plants and animals have evolved with consistent day–night cycles, often using light as a cue in critical life-history strategies such as reproduction, migration, and foraging (Seymoure *et al.* 2025; Moore *et al.* 2006; Sanders *et al.* 2021). Disruption of these cues through artificial illumination alters photoperiodism, phenology, and circadian rhythms (Longcore & Rich, 2004; Gaston *et al.* 2012; Crump *et al.* 2021; Cronin *et al.* 2014). Consequently, ALAN has widespread ecological effects (Bará & Falchi, 2023). However, lighting is also for people, serving important social functions of comfort, safety, and recreation. Understanding how humans perceive and value lighting in PPAs is essential for finding a balance between necessary illumination and conservation of natural nightscapes.

1. Research Background

1.1. Protected Areas and Human Experience

As urban and ex-urban growth boundaries continue to increase, managers of PPAs that are charged with protecting ecological and cultural resources, including the natural night environment and night sky, are becoming more concerned not only with resource protection but also visitor experiences at night (Beeco *et al.* 2011). Increasingly, artificial light is leading to the degradation of natural darkness and the quality of experiences for nighttime visitors to parks (Smith & Hallo, 2019). Correct to the following: Natural darkness is an important consideration for nature-based noctourism. Noctourism can be defined as nature-based tourism activities at night in which natural darkness is critical to the experience (Beeco et al., 2025). Dark sky tourism (a subcomponent of nature-based noctourism) is an important driver of visitation for people who are motivated to view dark, star-filled night skies (Kulesza *et al.* 2013; Mitchell & Gallaway, 2019), and nighttime recreation experiences are important to visitors' overall park experiences (Smith & Hallo, 2019). Nighttime recreation in PPAs provides unique and valuable experiences for visitors, and natural night sky conditions are essential qualities of wilderness (*i.e.*, untrammeled, natural, undeveloped opportunities for solitude) (Beeco *et al.* 2011; Beeco *et al.* 2015). Many parks also provide special programs focused on biological resources, such as fireflies and bat flight programs or events, where natural darkness is vital for both enhancing these experiences and preserving these natural resources (Henry *et al.* 2022). However, artificial light can detract from the visitor experience. That is perhaps why visitors report overwhelming support for management actions to protect night sky quality (Beeco *et al.* 2023). Of the seven different management actions presented to visitors at state and national parks in Utah, U.S. for protecting night sky quality, all seven management actions had over 75% support (Beeco *et al.* 2023).

The literature of human responses to lighting at night has many conflicting findings with respect to social constructs and preference; however, research findings specific to parks and protected areas are beginning to reveal a more consistent trend (Beeco *et al.* 2025). While earlier research on the visitor experience at night revealed that lighting could distract from a visitor's experience (Smith & Hallo, 2019), this finding was generally broad, and little is known specifically about lighting's impacts on people. Recent experimental light manipulation studies have found that light pollution can negatively impact mood, arousal, and scenic evaluations (Benfield *et al.* 2018). Some studies have found lightscapes to have no impact on perceptions of safety (Smith & Hallo, 2019; Benfield *et al.* 2018; Calleri *et al.* 2019). Little is known about the lighting characteristics (*i.e.*, spectra and intensity) that would be considered acceptable to nighttime visitors in PPAs. Fristrup *et al.* (2024) determined that visitors in Grand Teton National Park assessed red lighting as more protective of the environment and expressed higher ratings for visual comfort and safety. Brightness, spectra, and fixture type are three critical elements of lighting design to consider. Regarding light brightness, previous research in urban settings has explored the effects of light fixture intensity on participants, finding that participants preferred lower intensity, warm white fixtures to higher intensity, neutral white fixtures (Davidovic *et al.* 2019). Additionally, in urban setting, Lis *et al.* (2024) found that evenly lit spaces are preferred in nighttime green space environments. In terms of light spectra, the amount of light pollution emitted by light fixtures is related, in part, to the spectral characteristics of lamps (Falchi *et al.* 2011). Falchi (2011) found lamps with high blue content had a significant impact on human health and visual perception (Falchi *et al.* 2011). Spectral composition of lighting type and characteristics of lighting can inform the conversion of current lighting infrastructure to be more efficient in parks and other natural areas (Davidovic *et al.* 2019; Elvidge *et al.* 2010).

1.2. A Sister Study

The study reported in this manuscript is part of a larger study and master's thesis (Crump, 2023). The findings in two other published analysis are worth highlighting here. The first paper used the same sample and lighting fixture type, though different methodology. Overall, there were seven light stations installed along grass-field edge habitats and trailed forest areas in a university that managed arboretum. The first six stations were used in prior analysis (Himschoot *et al.* 2024) and deployed in a random rotating configuration of two different light colors, warm white (3000K Correlated Color Temperature (CCT)) and amber (695 nm direct amber), and with varying intensities. Eight experimental lighting conditions were used: amber 0.5 lux, amber 1.0 lux, amber 5.0 lux, amber 10.0 lux, warm white 0.5 lux, warm white 1.0 lux, warm white 5.0 lux, and warm white 10.0 lux. A survey was conducted at each light station which included feelings about the light condition, and a series of tasks designed to explore participant's ability to perceive their environment was also undertaken. Himschoot *et al.* (2024) found that study participants were 36% more likely to report greater feelings of safety in warm white light than amber light and 82% more likely to report greater feelings of safety at intensity levels 5 lux or higher.

The second study used three different samples, including Grand Teton National Park, Acadia National Park, and the arboretum data we used here (Beeco *et al.* 2025). The study found that visitors to protected areas are generally willing to sacrifice human preference and feelings of safety for more conservation focused lighting. However, the findings were not as strong for the arboretum sample as compared to the two national park samples.

In the analysis presented in this study, only Station 7 data are analyzed. While more details are presented below in the Material and Methods section, generally, at Station 7 visitors were asked to select which light color and level of light they preferred based upon the question "Imagine that you are tasked with selecting lighting that strikes a balance of conditions that are good for both humans and wildlife. What would be the most ideal nighttime lighting condition?" Asking participants to "strike the balance" is a much different question than simply asking for a preference or feelings of safety.

1.3. Study Purpose and Research Questions

There is a precedent for providing light at night in human occupied spaces including developed areas of PPAs, but it remains unknown about what amount and color of light is necessary in these spaces (Smith & Hallo, 2019). With the rise of LED technology, ALAN use has increased per capita, however, this technology is easily controllable, thus able to be retrofitted to have a lower lighting impact on the environment. Industry standards addressing outdoor lighting are generally developed for the built environment providing prescriptive illuminance recommendations based on application, level of use, and assumed ambient background conditions. These areas likely do not share environmental context or missions similar to PPAs for protecting natural and cultural resources including the night sky, therefore may not be appropriately applied to PPAs. Further, contrast is an important factor in lighting design, and PPAs are likely to have darker ambient conditions which may allow lower levels of light for necessary contrast. There is currently no standard level of light that is required in PPAs, and work is needed that can act as a guide for determining context sensitive light levels in PPAs. It is important to understand ALAN lighting preferences for those who visit PPAs at night to make acceptable and necessary changes in lighting infrastructure as well as educate the public (by example and education programing) about the importance of proper outdooring lighting. Policy and management of nighttime lighting conditions should maximize the benefits of artificial lighting while limiting the costs (Gaston *et al.* 2015), and upgrades to the lighting systems used by PPAs can help meet the agencies' mandates to protect naturally dark skies and the night environment as a social and ecological resource.

This study sought to advance understanding of outdoor lighting preferences in relation to spectra and intensity in a PPA setting by addressing the following research questions: (1) What spectra of light do participants prefer in the context of creating the most ideal nighttime lighting condition? (2) What intensity of light do participants prefer in the context of creating the most ideal nighttime lighting condition? (3) Do any demographic characteristics (*i.e.*, gender, youth environment, previous nighttime outdoor recreation experience) influence lighting preference?

2. Methods

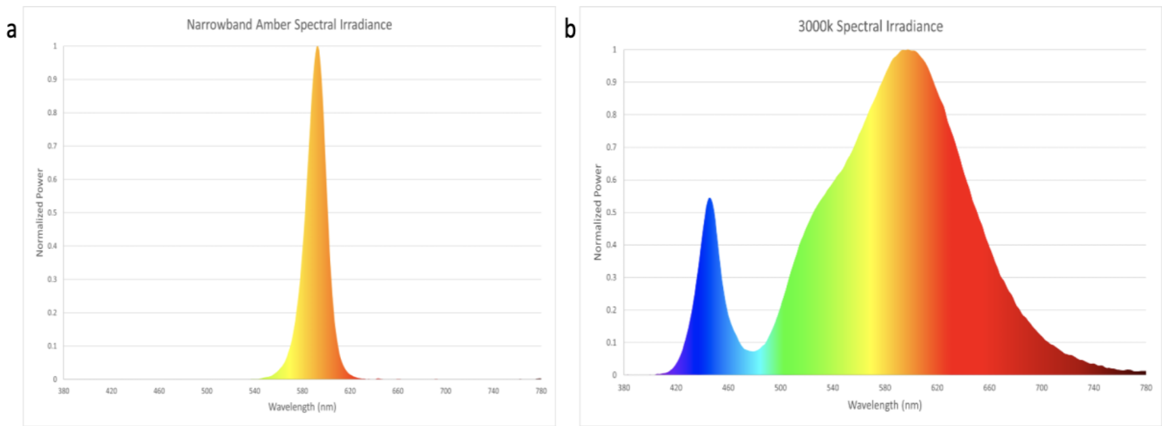
This study took place at an arboretum (Figure 1) of a large rural university in Pennsylvania, U.S. in the fall of 2021, spring of 2022, and fall of 2022. While this arboretum is a more developed setting than some PPAs, the rural nature of the university makes the quality of the night sky and the amount of light pollution visible at night from the study site comparable to many PPAs. The arboretum covers 340 acres of land, including fields and woodlands that are used for research and recreation. This study location is also similar to front country areas in iconic U.S. PPA settings, as well as other NPS units such as national arboreta, historic sites, and urban-facing park units, where visitor experiences often involve a blend of natural and developed landscapes. This study site allowed for two primary advantages over conducting the study on state or federal lands. First, the sample of university students is more diverse across most demographic categories than visitors to PPAs, excepting age which skews lower. This sample also allows generalizing to certain demographics of non-PPAs users, something that survey work on state and federal lands lacks. Second, the experimental design took significant time for participants to complete (approximately 40 minutes). A study this long would likely place an unreasonable burden upon recreationists in a PPA.

Figure 1. Map of the study site and lighting stations

2.1 Lighting Design

A pathway lighting fixture that would be suitable for PPAs was selected for this experiment. Pathway lighting is a prevalent application across PPAs which provide visitor access at night, thus bollards, short pole lighting fixtures, were selected to meet these needs. In an effort to protect the natural night as a social, cultural, and ecological resource across protected areas several criteria were used to select an appropriate bollard. These criteria included fixtures producing zero-uplight, controlled light distribution with backlight control, dimming controls, and both broadband and narrowband color options. The Kim Pavilion™ bollard met each of these criteria with options that produced no uplight, used Type 3 light distribution with no backlight via an optional house side shield, used dimmable LED drivers, and provided 3000K Correlated Color Temperature (CCT) and 695 nm direct amber LED engines (Figure 2). We selected the 14-watt 3000k LED engine and 22-watt direct amber engine for the experiment. The higher wattage of the direct amber bollard was necessary to ensure both light engines could produce a near-equal light output range as perceived by a photopic adapted observer.

Figure 2. Spectral profiles for the **a.** 695 nm direct amber LED engines and **b.** 3000K



Each bollard was fitted with a custom dimmer and voltage meter display allowing survey participants to control light output in the field, and researchers to record voltage. Light output was measured in average horizontal illuminance in lux (lx), the SI unit for illuminance and the standard metric for pathway lighting design. It should be noted that the term "intensity" is used in the survey instrument to ensure participants understood what they were selecting. Average lux was calculated using an evenly spaced grid of illuminance measurements across a 20 ft. x 10 ft. space representative of the expected area of illumination for a light along a pathway. All measurements were made with a Konika-Minolta T-10a illuminance meter. Prior to deployment we measured average illuminance and voltage output across a range of dimmer settings, and during the Himschoot *et al.* (2024) survey we collected illuminance and voltage measures, allowing us to derive average illuminance from user inputs in the field based on the reported voltage output during the experiment (see equations 1 and 2 in section 2.5 Field Design). While the Himschoot *et al.* (2024) study used matched preset lux levels for each color treatment, this study allowed users to set intensity using a continuous dial, based on preference. Due to the higher efficacy of the 3000K light engine, the maximum selectable intensity of this bollard was higher than direct amber.

2.2 Field Design

Seven individual lighting stations were installed in both the edge habitat and in the trailed segments of the forest in the Arboretum (Figure 1). Participants were guided by a researcher through the first six stations in groups before individually completing Station 7. This analysis focuses only on Station 7.

At Station 7, participants were asked to identify the spectra (amber or white) of light and level of intensity they preferred in a specific context. Participants were posed the following question: "Imagine that you are tasked with selecting lighting that strikes a balance of conditions that are good for both humans and wildlife. What would be the most ideal nighttime lighting condition?". Participants were instructed to select which spectra and intensity they preferred on a bollard lighting fixture (see below for details). Participants completed lighting selection at Station 7 individually (rather than in a group) to eliminate potential bias from viewing other participants' selections.

2.3 Survey Methods

The survey data was collected using convenience sampling. Recruitment flyers for the study were distributed to general education courses in multiple departments, including but not limited to Recreation, Park and Tourism Management; Geography; Education; English, and Wildlife and Fisheries Science. Faculty and staff distributed the recruitment flyers via email and class announcements. A survey was developed in Qualtrics for quantitative data collection using tablet computers.

The survey activities and instruments were divided into two primary sections. This paper focuses only on Section Two of the study. Section One of the surveys focused on participants' ability to navigate and complete tasks at a set of six specially designed activity stations that tested their perception of light. Results of Section One can be found in Himschoot et al (2024). After completing Section One, Section Two of the survey collected information about participants' preferences of light color and intensity, participant demographics, and participants' values, management preferences, and previous experiences in relation to outdoor recreation areas at night.

The study was approved by the Pennsylvania State University's Institutional Review Board (STUDY00017949) as well as the U.S. Office and Management and Budget (OMB 1024-0224) The Pennsylvania State University's Institutional Review Board determined this work to be exempt from formal IRB review. Participation in this study was voluntary, and all participants were informed their data were going to be used by "NPS Managers and Planning staff in future initiatives related to the visitor use and resource management related to night skies," and reported, "in aggregates … no individually identifiable responses will be reported," to obtain informed consent.

Each participant was given a Samsung Galaxy A7 Tablet with screen light control through the mobile app Twilight. Twilight allowed tablet screens to be viewed in red light to minimize obstruction to respondents' night vision. Before beginning the survey, informed verbal consent was obtained from all the participants. Consent was documented through each participant hitting "agree" at the beginning of the survey. The study took around 40 minutes to complete and was guided by a research technician. A total of 167 responses were collected over the course of 16 months with a sampling period of five months.

2.4 Data Analysis

All statistical analyses were performed in R version 4.2.2 (R Core Team, 2021) Data was cleaned and voltage values recorded at Station 7 were converted to average illuminance values (lx) using Equation 1 for the participants who selected direct amber as their color preference and Equation 2 for those who selected white as their color preference. These equations, derived from lab and field measurements of average lux and voltage output, allowed for rapid calculation of average illuminance along a continuous range of voltages recorded during the survey. Equations were provided by the National Park Service's Natural Sounds and Night Skies Division.

(1) Illuminance = -(0.1078voltage2) + (2.5085voltage) – 2.2725

(2) Illuminance = 2.9483voltage – 2.5415 (2)

The survey data were confirmed to be normally distributed to enable the use of parametric tests. This also included viewing the demographic information of study participants (Table 1). The basis of this study is exploratory analysis due to the lack of literature that would conventionally guide hypothesis testing with a similar data set. With this, all statistical tests were performed to inform the guiding research questions of what spectra and intensity of lighting participants prefer as well as if any participant characteristics influenced their lighting preference.

To explore participant selection of spectra, a χ^2 goodness of fit test was conducted for the choice in spectra (amber or white) (Figure 3). The relationship between spectra and intensity was explored by performing a one-sample t-test testing for significance in intensity in relation to the spectra (Figure 3).

To understand if participant characteristics influence choice in spectra and intensity, select demographics of survey respondents were examined (Table 1). Spectra choice and participant characteristics were modeled (nighttime recreation experience, youth upbringing environment, gender) using one-way ANOVA. Two-way ANOVA testing between spectra choice and participant characteristics as explanatory variables and intensity were conducted after running the initial ANOVA test (Figure 4).

3. Research Results

Survey participants (n=167) were evenly distributed in relation to gender. Because the sample came from a university campus, most participants were college-aged (24% were between the ages of 18 and 19 and 60%

were between the ages of 20 and 24). The majority of participants had a suburban youth environment, were residents of the United States, and had engaged in a prior nighttime recreation experience (Table 1).

Table 1. Descriptive results of the sample

Group	n	Percent Sample
Gender		
Male	82	49.10%
Female	82	49.10%
Youth Environment		
Rural (population <5000)	38	22.75%
Suburban (population between 5000 and 50000)	92	55.08%
Urban (population >50000)	33	19.76%
Country of Residence		
U.S. Resident	148	88.62%
Non- U.S. Resident	15	8.98%
Prior Nighttime Recreation Experience		
Yes	131	78.44%
No	33	19.76%

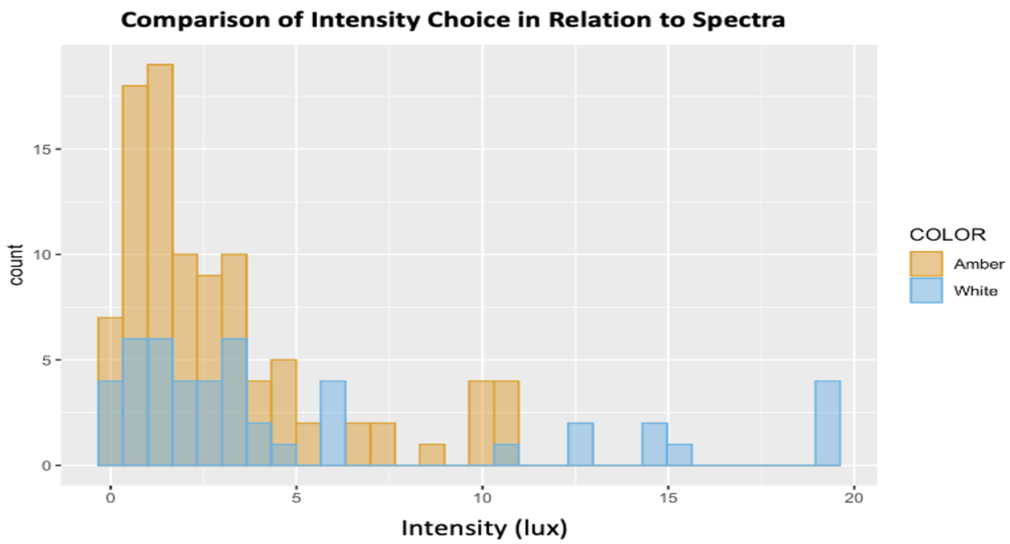
3.1 What Spectra of Light Do Participants Prefer in the Context of Creating the Most Ideal Nighttime Lighting Condition?

In examining participant preference of spectra, the majority of participants selected amber light (n=97 out of 144 [67%]). The Chi-square goodness-of-fit test showed that the distribution of the number of participants who chose amber or white in this study was not consistent with the expected distribution of a 50:50 distribution ($\chi^2 = 17.361$; df = 1; p = <0.001). This means that the color choice of amber (n=97) is significantly different than the color choice of white (n=47 out of 144 [33%]) at Station 7.

3.2 What Intensity of Light Do Participants Prefer in the Context of Creating the Most Ideal Nighttime Lighting Condition?

In looking at the interaction between the choice of light intensity in relation to spectra, there is a significant difference in mean intensity between amber (mean = 2.87) and white (mean = 5.18) (t (-2.5318); df = 56.246; p=0.01417) (Figure 3). These results suggest that amber light is the preferred color of light with 2.87 lux being the average level of intensity preferred. For comparison, 0.2 lux is the average illuminance of a natural full moon.

Figure 3. Participant choice of spectra and intensity (lux)



Interestingly, participants who selected white light preferred it at a higher intensity (mean = 5.18) than those who selected amber light (mean = 2.87). Figure 3 displays the variation in lux values per color choice.

3.3. Do Any Demographic Characteristics - Gender, Youth Environment, Previous Nighttime Outdoor Recreation Experience - Influence Lighting Preference?

Regarding color selection in relation to participant demographics, those who had previous experience with nighttime outdoor recreation were more likely to select the amber light than the white (Table 2). Looking at light intensity selection, those who had prior outdoor nighttime recreation experience and selected amber light had the lowest mean intensity selection of 2.48 lux (Table 2). Both males and females were more likely to select amber light than white light (Table 2). Those who were raised in rural or suburban environments were more likely to select amber light; however, in looking at those raised in urban areas, there was no clear preference of white or amber light (Table 2). Those who were raised in urban environments and selected white light selected the highest mean intensity at 5.93 lux (Table 2).

Table 2. Descriptive statistics for ANOVA testing.

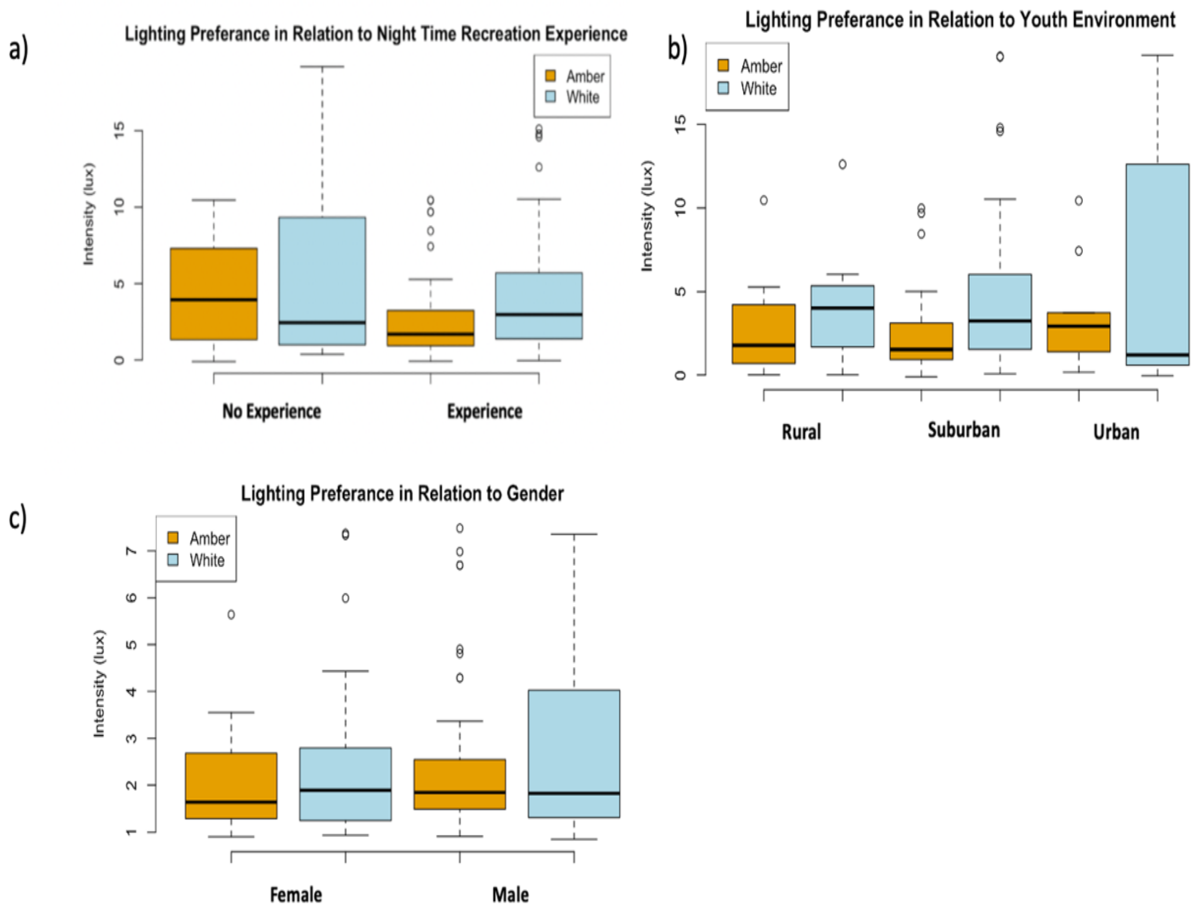
Color	Prior Nighttime Outdoor Recreation Experience	n	Mean	Std. Deviation
Amber	Yes	80	2.48	2.37
	No	17	2.72	3.86
White	Yes	35	4.96	5.55
	No	12	5.78	7.09
Color	Gender	n	Mean	Std. Deviation
Amber	Male	49	2.97	2.76
	Female	48	2.78	2.86
White	Male	23	5.60	6.32
	Female	24	4.77	5.59
Color	Youth Environment	n	Mean	Std. Deviation
Amber	Rural	22	2.95	3.05
	Suburban	57	2.48	2.49
	Urban	17	4.08	3.35
White	Rural	7	4.38	4.17
	Suburban	26	4.98	5.68
	Urban	14	5.93	7.25

Table 3. (a) ANOVA table comparing intensity (lux) across spectra choice and prior nighttime recreation experience. (b) ANOVA table comparing intensity (lux) across spectra choice and gender. (c) ANOVA table comparing intensity (lux) across spectra choice and youth environment.

(a)	df	Sum of squares	Mean square	F	p
Color	1	68.90	68.90	4.22	0.042*
Nighttime Recreation	1	50.79	50.76	3.11	0.040*
Color*Recreation	1	10.82	10.82	0.66	0.417
Error	141	2298.00	16.30		
(b)	df	Sum of squares	Mean square	F	p
Color	1	168.80	168.80	10.04	0.02*
Gender	1	8.37	8.37	0.98	0.48
Color*Gender	1	3.25	3.24	0.19	0.66
Error	140	2353.71	16.81		
(c)	df	Sum of squares	Mean square	F	p
Color	1	391.90	89.35	5.29	0.023*
Youth Environment	3	38.25	12.83	5.29	0.52
Color*Youth Environment	2	5.76	2.88	0.76	0.84
Error	137	2325.3	16.90		

Two-way ANOVA testing confirmed that there is a significant relationship between color selection and intensity (Table 3a,b,c). In looking at intensity in relation to color and gender or youth environment, there was no statistical significance in relationship to the gender or youth environment (Table 3b,c). However, when conducting an ANOVA test for intensity selection, color selection, and prior nighttime recreation experience a significant relationship was found (Table 3a, Figure 4) (Amber-Experience n=80, Amber-No Experience n=17, White-Experience n=35, White-No Experience n=12).

Figure 4. (a) Intensity (lux) in relationship to color choice and nighttime recreation experience (b) Intensity (lux) in relationship to color choice and youth environment (c) Intensity (lux) in relationship to color choice and gender



4. Discussions

In this study participant preferences for various spectra and intensity of artificial lighting at night in a park and protected area-like setting was investigated. Results can inform researchers to better understand human preferences of artificial light at night in outdoor recreation settings to better manage lighting in PPAs.

Gaston *et al.* (2017) identified minimum required levels of lighting in general as a current gap in the literature and as an area needing to be addressed. Because of the dearth of industry or park standards for lighting requirements that are specific to the unique purposes and missions of PPAs, park managers are left to determine lighting levels and design on their own. Through this experimental study, which asked participants to identify the intensity and spectra of light considered appropriate for a park-like setting for pathway lighting, the level of light necessary for PPAs is better understood. Study results show statistical significance in the selection of spectra by participants. Significantly, more participants selected amber (n=97) than white (n=47). Results were inconsistent with Smith and Hallo's (2019) study where park visitors preferred white light for pathway lighting; however, in the previous study, visitors did prefer warmer lighting for purposes other than pathway lighting. However, visitors in Grand Teton National Park expressed higher ratings for visual comfort and safety under red streetlight lighting than white streetlight lighting (Fristrup *et al.* 2024). Possible causes of differences in results could be due to sampling population, sampling size, demographic variables, or a difference in spectra used in the study. Smith and Hallo (2019) used 4200K for white light whereas this study used 3000K for white light which is equivalent to their warmer lighting (3000K) which was preferred at comfort stations and amphitheatres. Fristrup et al (2024) utilized blended red-white lamps consisted of 30 narrowband LED with a peak wavelength 623 nm and two 3000 K white LEDs (Fristrup *et al.* 2024). Introducing white light into the fixtures improves color rendering (Fristrup *et al.* 2024). Further, differences in results could be related to a more general societal understanding about the effects of light pollution and a better understanding of how the color of lights impact both wildlife and stargazing. There is growing literature, signage, and promotion of wildlife and stargazing friendly lighting colors and practices, such as turning off lights during bird migration or encouragement of using the red-light function of headlamps to preserve night vision, in recent years (Elgert *et al.* 2020; Peña-García & Sędziwy, 2019; Schulte-Römer *et al.* 2019).

Beyond color alone, results show a significant difference in intensity preference (how bright participants wanted the light) between those who chose amber light and white light. Participants who chose amber light selected a much lower average intensity of 2.87 lux compared to those who chose white light selected an average intensity at 5.17 lux. While 2.87 lux is still much higher than any naturally occurring light (*i.e.*, a full moon), this lighting level is consistent with the lowest recommendations from the most recent ANSI/IES RP-43 standard for pedestrian walking surfaces for Lighting Zone 1 (2 lux) (IES, 2022). Smith and Hallo (2019) found the preferred lighting intensity for path lighting of visitors to be 1.4 lux, but this value is only comparable to those who selected white as their preferred hue in this study. Results suggest that with amber light, park visitors would find a lighting intensity of 2.87 lux to be acceptable for outdoor nighttime recreation for pathway lighting. As with any recommendation, there will be outliers. Within this study, participants who chose amber did so in the intensity range of 0.10 to 10.46. This all should be taken into consideration for managerial action.

This study also sought to determine if any visitor characteristics or demographics influenced lighting intensity and spectra choice. Across participant characteristics of gender, youth environment, and previous nighttime recreation experience, there was no statistically significant relationship between spectra choice and any of the characteristics. However, there was a statistically significant relationship between intensity with the explanatory variables of previous nighttime recreation experience and spectra choice. Interestingly, those without previous nighttime recreation who selected amber as their spectra had a higher mean intensity (lux) than those who selected amber with previous recreation or those who selected white for their spectra. While a higher intensity of light is not preferred for resource protection, selection of amber by those without nighttime recreation is an encouraging result. Those without nighttime recreation experience may have selected a higher intensity for reasons of perceived increase in safety (Peña-García & Sędziwy, 2019). Some studies have found that individuals often associate brighter lights with feelings of safety, however, too bright of light can be counterproductive in increasing the visibility of their surroundings due to glare and contrast with shadows (Stone, 2017). The lack of results from testing participant characteristics, like visitor demographics in PPAs, regarding spectra and intensity selection is encouraging. However, given that this study drew from a relatively homogeneous, student-based sample, findings should be interpreted with caution. While adequate for exploratory research, this sample may not fully represent the broader diversity of park visitors. Expanding future work to include a wider range of demographic and experiential backgrounds would strengthen understanding of how lighting preferences vary across visitor populations.

Perhaps most interesting, is the differences in results between the analysis presented here and the findings of the sister study by Himschoot *et al.* (2024). Himschoot *et al.* (2024) found that study participants were 36% more likely to report greater feelings of safety in warm white light than amber light and 82% more likely to report greater feelings of safety at intensity levels 5 lux or higher. Yet, when asked "Imagine that you are tasked with selecting lighting that strikes a balance of conditions that are good for both humans and wildlife. What would be the most ideal nighttime lighting condition?" the findings presented here suggest participants selected a preference for low-level amber lighting. These differences could be due to methodological differences – including that the first 6 stations had fixed settings while Station 7 had an interval setting. However, the difference could also be due to the question participants were posed at Station 7 – specifically asking for a balance between humans (presumably their preference) and wildlife. Although a specific educational intervention was not used here, this finding aligns with a prior study that found participants who valued biodiversity rated lower lighting levels more favourably when they were provided with information about the impact of lighting (Boomsma and Steg, 2014). Further, the findings here actually do align with the other sister study by Beeco *et al.* (2025) that found participants at the arboretum were willing to trade-off their own preferences and feelings of safety for lighting that focused on wildlife and natural night conservation needs. These finding all suggests that asking participants to balance the benefits of lighting for humans against the environmental impacts is an important component of making research informed design selection for lighting.

Limitations, Conclusions, and Further Research

The mean age of participants in this study was 20 years old, and the results of color and intensity preference may change when sampling a more diverse age range. In the Smith and Hallo (2019) study in Acadia National Park, the average participant age was 41.4 years old with a range of 18 to 63 years of age whereas this study had a range of 18 to 58 years of age with an average of 20. Smith and Hallo (2019) did test different light colors, but younger visitors may be more accepting of different lighting colors than the average park visitor. There have been reports of fewer young people and increasing numbers of older people visiting national parks over the past few years (Keen & Dorrell, 2012). At its face, age is an important consider of lighting due to declining visual abilities and is certainly a limitation of this study – suggesting replication in a different environment is needed.

The sampling for this study took place on a large U.S. university campus with a mostly student-based sample. While there are disadvantages to this, such as a younger sample size described above, there are also many advantages. Most importantly, this is a sample made up of both experienced and inexperienced visitors to PPAs (*i.e.*, university arboretum). While similar studies inside of parks are important, this study informs lighting preference from participants who may be less familiar with PPAs than studies taking place in actual PPAs. Sampling human preference about parks from non-park visitors is a valuable effort, especially on a topic ubiquitous to all 21st century humans – artificial light at night.

Additional study is needed to better understand the socio-ecological impact of lighting in protected areas. Future studies should focus on sampling in PPAs, examining both wildlife and human responses to lighting simultaneously, examining a wider variety of colors/intensities, examining lighting fixtures beyond bollards alone, and examining how information or education may influence human responses to lighting.

This study revealed visitors' preferences of lighting spectra and intensity in a park-like setting. The objectives of this study were twofold. The first objective was to develop a reference point for lighting preferences across both intensity and spectra that can be consulted when retrofitting and updating park lighting, especially for bollard style lighting. The second objective was to better understand how visitor demographics influence lighting preference for nighttime outdoor recreation. Taking into consideration the intensity and color choice of participants, managers could both lower the brightness of park lights while also implementing warmer colors of lighting into a park's light design. Further, since previous nighttime recreation experience was the only significant demographic predictor of intensity and spectra, education may play a critical role in visitor acceptance of non-traditional light regimes in PPAs. This paper is not suggesting any specific lighting values or threshold for general PPAs or specific parks. Rather we present these findings as reference points in an area of study (and management) that has a dearth of information.

General principles for responsible and sustainable lighting guidance issued by the DarkSky International, Illuminating Engineering Society, Design Lighting Consortium, and the U.S. National Park Service all suggests that using light only when needed, using the correct amount of light, and using warmer spectra of lighting are all advisable when lighting the human environment while limiting the detrimental impacts of light to the environment (Beeco *et al.* 2023). This study supports these recommendations and begins to quantify the 'right amount of light' for pathway applicants in parks - suggesting a lower level of light should be considered. Further, the broader support for amber lighting over white lighting is also encouraging because most research to date suggests that warmer color lights have less influence on wildlife and insects. However, lighting will always be very context specific.

The night sky is an important cultural and ecological asset with important benefits to humans and wildlife (Gallaway *et al.* 2010; Mace *et al.* 2004) and is protected by the laws and policies of the many PPAs, including U.S. NPS. The literature related to ALAN and light pollution is heavily saturated with studies on the impacts of lights on wildlife but rarely takes into consideration visitor needs or preferences of lighting when making suggestions for change in PPAs. Natural dark skies are increasingly recognized as an important cultural and experiential resource in national parks (Smith & Hallo, 2019; Manning *et al.* 2016). With this in mind, it is critical to keep the visitor at the forefront of managerial decisions alongside considerations of wildlife and the environment, as lighting is after all for humans. This study suggests that a better balance in lightscape management within parks and protected areas, that prioritizes wildlife friendly lighting regarding spectra while considering lighting needs of visitors in relation to intensity, can be found.

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Credit Authorship Contribution Statement

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B. Derrick Taff: Conceptualization, Investigation, Methodology, Project administration, Writing – review and editing, Funding acquisition.

J. Adam Beeco: Conceptualization, Investigation, Methodology, Project administration, Writing – review and editing.

Jeremy White: Conceptualization, Investigation, Methodology, Validation, Writing – review and editing, Visualization.

Stephanie Buckley: Conceptualization, Investigation, Methodology, Writing – review and editing.

Steve Lawson: Conceptualization, Investigation, Methodology, Validation, Writing – review and editing.

Peter Newman: Conceptualization, Investigation, Methodology, Project administration, Writing – review and editing, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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Sustainability Transition in Tunisian Companies: Challenges, Dynamics, and Comparative Perspectives

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Abstract: This article explores the sustainability transition of Tunisian companies in a context characterized by institutional instability, limited access to green financing, and weak regulatory incentives. Using a mixed-methods approach, the study combines a quantitative survey of 120 companies, 20 semi-structured interviews with key stakeholders, an international comparative analysis (France, Germany, Morocco), and a broader regional perspective encompassing MENA countries (Middle East and North Africa). Results show growing awareness of sustainability, but implementation remains limited. The study identifies internal/external barriers and highlights levers to overcome them. The integration of the MENA regional perspective enriches the analysis by situating the findings within a broader framework, revealing both convergences and specificities. The article offers concrete recommendations for policymakers, entrepreneurs, and researchers, emphasizing the need for systemic change involving managerial innovation, policy reforms, and greater stakeholder engagement.

Keywords: sustainability transition; Tunisian companies; Corporate Social Responsibility; institutional barriers; circular economy; international and regional comparison.

JEL Classification: Q01; Q56; M14; O17; Q53; O55.

Introduction

Today, the transition towards sustainable business models has become a strategic priority for companies. They must respond to environmental degradation, increasingly stringent regulations, and evolving societal expectations. The United Nations'2030 Agenda, with its Sustainable Development Goals (SDGs), reinforces these requirements (UNDP, 2015). At the global level, sustainable transition has become imperative to address the challenges of the climate crisis, social inequalities, and economic imbalances.

Tunisia, as an emerging economy, particularly illustrates these issues. Successful sustainability transition requires coordinated mobilization of all stakeholders: companies, government, financial institutions, and civil society. Innovation – both technological and managerial – plays a crucial role in accelerating this transition, enabling the creation of new business models and solutions tailored to local realities.

In Tunisia, while corporate sustainability is attracting growing interest among entrepreneurs, academics, and institutional actors, its implementation remains uneven and often marginal within business strategies. While some pioneering initiatives emerge, most Tunisian companies lag in integrating environmental and social concerns. This situation can be explained by a set of structural constraints, such as institutional instability, limited access to green financing, and the absence of an enabling regulatory framework.

Similar to other countries in the MENA region, these structural challenges are particularly pronounced. Companies in this region face comparable issues, including inadequate infrastructure, unsuitable regulatory frameworks, and restricted access to sustainable financing (El-Kassar & Singh, 2019; OECD, 2021). Socio-political dynamics also play a role. Heydemann (2020) notes post-2011 Arab regimes adopted exclusive social pacts, limiting companies' capacity for sustainable practices.

Within this context, a key question arises: How can Tunisian companies overcome structural and institutional challenges to achieve a successful sustainability transition? This question guides the analysis in this article, which aims to identify the strategic and institutional levers necessary to transform these constraints into opportunities.

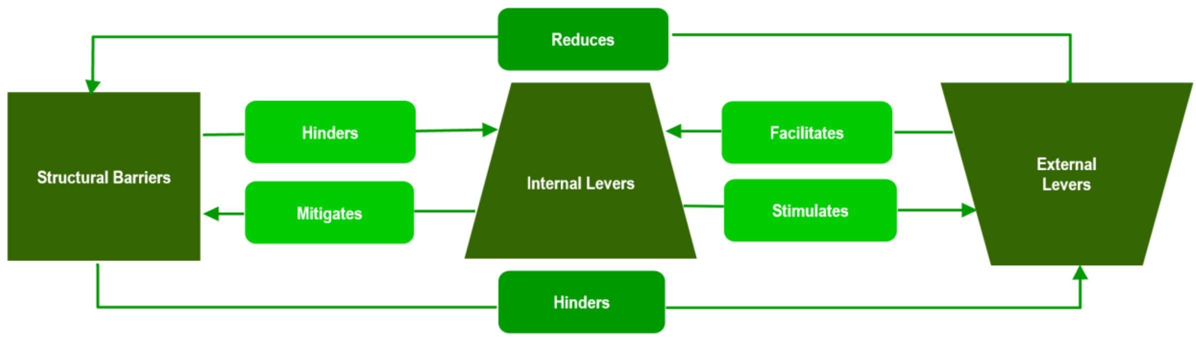
This study fills a literature gap on sustainability transition in developing countries and MENA, highlighting obstacles in "institutional voids." Based on local empirical analysis (a survey of 120 companies and qualitative interviews) and an international comparative perspective (France, Germany, Morocco), this article aims to identify relevant levers to accelerate the sustainability transition in Tunisia and the MENA region.

The article is structured into four main sections. First, the methodology is detailed, combining quantitative and qualitative approaches to analyze obstacles and opportunities. Next, the study's results are presented, highlighting the main barriers and levers for the transition of Tunisian companies. A thorough discussion follows, analyzing these results from a regional and international perspective, notably by comparing them with the experiences of France, Germany, and Morocco. Finally, the article concludes with concrete and operational recommendations for key stakeholders – policymakers, entrepreneurs, and researchers – to support an effective sustainability transition in Tunisia and the MENA region.

1. Literature Review: Corporate Sustainability as a Strategic Paradigm

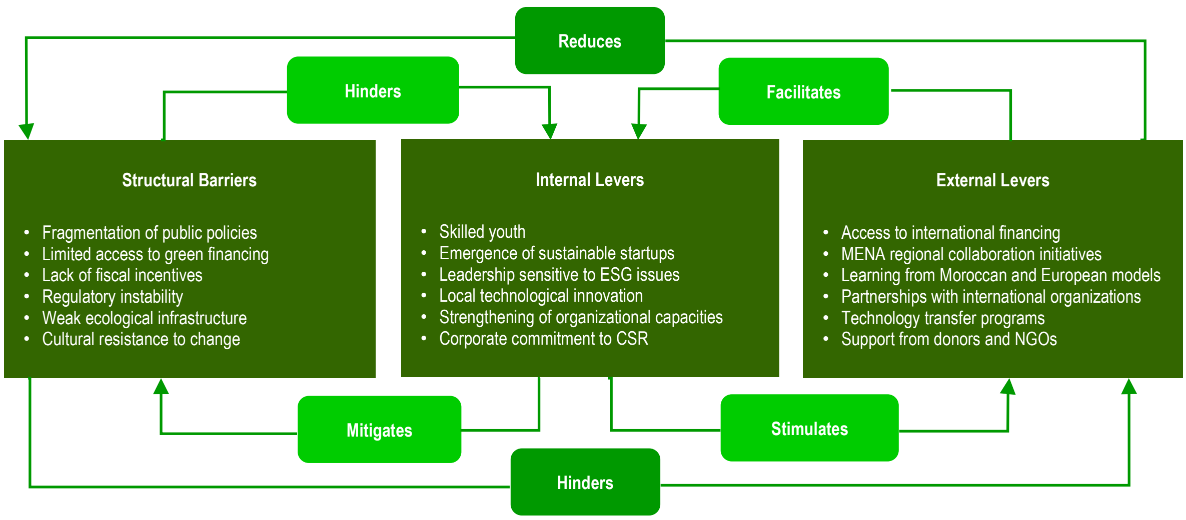
Corporate sustainability has become a key paradigm in management research, recognized as a lever for value creation and resilience (Dyllick & Muff, 2016; Baumgartner & Rauter, 2017). The dominant conceptual framework is based on the "triple bottom line" model, introduced by Elkington (1997) and updated in the context of the Sustainable Development Goals (SDGs). This model encourages companies to integrate their economic, social, and environmental performance in a holistic manner. However, the specific dynamics of regions such as MENA introduce particularities that require adaptation of Western theoretical frameworks. To analyze the sustainability transition in Tunisia, an enriched and adaptive conceptual framework is proposed. This framework adopts a cyclical structure to illustrate the ongoing interactions and interdependent dynamics between three main dimensions: structural barriers, internal levers, and external levers.

Figure 1. Conceptual Framework: Levers and Barriers to Sustainability in Tunisia



Source: Author's own elaboration.

Figure 2. Enriched Conceptual Framework: Levers and Barriers to Sustainability in Tunisia



Source: Author's own elaboration.

The arrows in the model illustrate the direct and feedback influences between these dimensions, highlighting their key role in the transition towards sustainability in Tunisia. Each of these dimensions is enriched by key variables, enabling a deeper understanding of the barriers, opportunities, and levers related to this transition.

1.1 Structural Barriers Hindering Sustainability

Structural barriers – such as institutional, economic, and cultural challenges – impede sustainability. These include the fragmentation of public policies, characterized by a lack of coordination between ministries and agencies, as well as limited access to green financing, which constrains SMEs and startups due to inadequate mechanisms. Additional obstacles include the absence of fiscal incentives to promote sustainable business models, regulatory instability caused by frequent changes in laws, weak ecological infrastructure, and cultural resistance to change, often associated with traditional models that hinder innovation. These barriers directly limit the effectiveness of both internal and external levers, hampering their deployment. Nevertheless, concrete actions and increased support can help mitigate or alleviate them.

1.2 Internal Levers: National Potential for Sustainability

Internal levers include dynamic youth and an innovative entrepreneurial ecosystem with emerging sustainable startups. A leadership increasingly aware of ESG (environmental, social, and governance) issues and the development of local solutions through technological innovation further reinforce this momentum. Additionally, the strengthening of organizational capacities and the growing commitment of companies to corporate social responsibility (CSR) complete this promising picture (Baumgartner & Rauter, 2017). The functional economy is a key internal lever. It refers to a business model in which companies prioritize the use of goods over their ownership, for example by offering services (leasing, maintenance) instead of selling products. This model promotes more efficient resource use, thereby reducing environmental impact. These internal levers also stimulate external levers by making the environment more attractive for partnerships and funding, while attenuating structural barriers through local and innovative approaches.

1.3 External Levers: Global Resources for Local Sustainability

External levers encompass numerous international opportunities to support the sustainability transition. Access to green financing, such as that available from the World Bank, is essential. Furthermore, regional collaborations within the MENA region and international partnerships provide valuable strategic and technical support. International standards, such as the European Sustainability Reporting Standards (ESRS), also offer useful tools for structuring sustainability approaches in Tunisia. Finally, integrating recent research on sustainability transitions in other emerging regions, such as Southeast Asia or Latin America, would enrich the analysis. In countries such as Thailand or Vietnam, innovative strategies for integrating the circular economy in key sectors like agriculture or manufacturing have shown promising results. Similarly, in Latin America, initiatives such as decarbonization projects in Chile or sustainable resource management in Costa Rica demonstrate how collaborative institutional frameworks can overcome constraints similar to those faced in Tunisia.

1.4 Dynamic Interactions and Systemic Approach

These three dimensions interact in a dynamic and interdependent manner. Structural barriers inhibit the deployment and impact of internal and external levers. However, a robust internal ecosystem, represented by internal levers, stimulates the interest of international partners, while external levers strengthen internal capacities through funding, technology, and expertise. Together, these levers create a virtuous cycle – a process in which each improvement drives further progress. For example, the strengthening of internal capacities attracts external funding, which in turn supports new local initiatives. Environmental indicators play a crucial role in quantifying the progress of Tunisian companies toward sustainability. Of the 120 companies surveyed, 31% have implemented actions to reduce their waste, achieving an average reduction of 15% in total volume. Industrial sectors stand out for initiatives such as source separation and material recycling, achieving the most significant results. Regarding CO_2 emissions, 25% of companies have invested in solutions to improve energy efficiency, enabling 12% of them to reduce their emissions by 10–20%. Furthermore, 22% of companies have adopted technologies aimed at reducing energy consumption, with an average reduction of 8%. These modest efforts show progress, especially among export-oriented companies, but remain limited without strong institutional and financial support. This dynamic model, based on an integrated cycle, reflects ongoing interactions in which each lever or barrier influences the others. It thus underscores the importance of a systemic and simultaneous approach to these three dimensions in order to maximize synergies, foster continuous improvement, and build a sustainable ecosystem in Tunisia.

1.5 Specificities of the MENA Context

In the MENA region, significant structural challenges persist. Low awareness of environmental issues and the absence of strong demand for sustainable products constitute major barriers (Jamali & Karam, 2018). For example, in Morocco, although national strategies such as the NSDS have been implemented, their impact in the private sector remains limited due to a lack of coordination between public and private actors (UNDP, 2022). In North Africa, "institutional voids" refer to the absence or inadequacy of regulatory frameworks, support mechanisms, and tailored incentives to support sustainable initiatives (Sinkovics *et al.* 2014). These voids limit the structuring of efforts and hinder the emergence of innovative solutions. Such obstacles directly reduce the effectiveness of internal and external levers, hampering their deployment. Nonetheless, concrete actions and increased support can help to mitigate or alleviate them.

1.6 Global and Multi-Level Perspectives

Companies that successfully transition to sustainability often adopt business models that integrate sustainability as a core component of their value proposition (Bocken & Short, 2016; Geissdoerfer *et al.* 2018). These models rely on systemic innovation – technological, organizational, and social – and use strategies like circular and functional economy, and resource pooling. Nevertheless, in MENA countries such as Tunisia, institutional and cultural constraints hinder the widespread adoption of these models, especially among SMEs, which constitute the bulk of the economic fabric. At the global level, corporate sustainability is influenced by both internal and external factors. From an internal perspective, literature underscores the role of leadership, organizational culture, employee engagement, and innovation capacity (Aguinis & Glavas, 2019). Leaders who promote a strategic vision of sustainability are better able to drive cultural change and integrate ESG considerations into decision-making processes. Externally, the institutional framework plays a decisive role. In developed countries, clear regulations, sectoral standards, and fiscal incentives serve as drivers of transformation (Kiron *et al.* 2017; Ranta *et al.* 2018). In contrast, in developing countries, these drivers are often absent or fragmented, limiting the impact of sustainable initiatives. Sustainable transition cannot be analyzed solely at the company level. It is part of a "multi-level dynamic" involving interactions among economic actors, public authorities, educational institutions, and civil society. The so-called "ecosystemic" approach to sustainability emphasizes the co-evolution of companies and their institutional, technological, and cultural environment. This approach is particularly relevant in contexts such as Tunisia, where ecological transition requires increased coordination across different levels of governance. This theoretical framework thus enables the identification of levers and barriers to sustainability transition, while considering the structural and cultural specificities of developing countries such as those in the MENA region.

2. Research Methodology

This research is based on a mixed-methods approach, combining quantitative techniques (a survey of 120 companies) and qualitative techniques (20 semi-structured interviews), following a triangulation logic inspired by Creswell's work (2014). This approach aims to provide an integrated and contextualized understanding of the dynamics of sustainability transition in Tunisian companies. By cross-referencing the perceptions of economic actors, the analysis of reported practices, and the experiences of countries facing similar challenges, the study seeks to identify national specificities while situating them within an international and regional framework, including a comparative perspective with countries from the MENA region.

Table 1. Overview of the methodological framework

Triangulated Methodological Approach		
120 Questionnaires	20 Semi-structured Interviews	France, Germany, Morocco, MENA countries vs. Tunisia
Analysis Tool: SPSS	Analysis Tool: NVivo	Analysis Tool: SWOT

Source: Author's own elaboration.

2.1 Quantitative Approach: Survey of Tunisian Companies

A quantitative survey was conducted (March–June 2024) with 120 Tunisian companies, balancing feasibility and representativeness. Methodological limitations, like selection bias, are discussed in the study limitations section. Geographical sampling covers the North, Center, and South regions of the country. These regions were selected to reflect the economic and social disparities in Tunisia, thereby providing a comprehensive view of sustainability dynamics in diverse contexts. The surveyed companies come from three main sectors: industry, services, and agriculture. The table below presents the distribution of companies by sector.

Table 2. Distribution of companies by sector

Sector	Percentage
Industry	42%
Services	38%
Agriculture	20%

Source: Survey data collected and processed by the author.

2.1 Quantitative Approach: Survey of Tunisian Companies

The sampling was purposively designed to include companies of various sizes, ranging from very small enterprises (VSEs) to large companies, while ensuring balanced geographical coverage. This choice guarantees a diversity of experiences and contexts, reflecting regional and sectoral variations in the adoption of sustainable practices. Statistical analysis reveals a significant association between company size and the level of engagement in sustainability, as confirmed by the Chi-square test (see Appendix C, Table C.1).

The data collected were enriched by key insights from interviews. For example, a Tunisian manager stated:

"Our European clients impose sustainable standards on us, but locally, there is no support to comply with them." This remark illustrates the international pressures faced by some Tunisian companies in the absence of adequate local support mechanisms. The questionnaire, based on literature (Sinkovics *et al.* 2014; Kiron *et al.* 2017; Geissdoerfer *et al.* 2018), covers company information, adoption of sustainable practices, motivations, obstacles, and stakeholder relationships.

The analysis of correlations between the different dimensions of sustainability reveals significant associations: governance is positively correlated with environmental (0.45) and social (0.32) scores, just as the environmental dimension is correlated with the social dimension (0.61). These results are detailed in the correlation matrix presented in Appendix C (Table C.3).

The questionnaire included closed questions, notably five-point Likert scales, as well as open-ended questions. A pre-test was conducted with ten companies to ensure the clarity and relevance of the questions. Data were analyzed using SPSS software (version 26). Descriptive analyses, such as means, frequencies, and standard deviations, were performed, as well as bivariate analyses, including Chi-square tests and Pearson correlations.

An exploratory factor analysis (EFA) was also conducted to identify the underlying structural dimensions of observed sustainability practices. The results of the exploratory factor analysis confirm the multidimensional structure of sustainable practices, with three main factors explaining 77.5% of the total variance. The detailed factor loadings for each variable attest to the coherence of the identified dimensions (see Appendix C, Table C.4). The table below summarizes major barriers faced by Tunisian companies during the sustainability transition.

Table 3. Barriers to the adoption of sustainable practices

Barriers to Adoption	Number of Responses	Percentage (%)
Lack of funding	9	45
Lack of internal skills	8	40
Low customer interest	6	30
Regulatory constraints	5	25
Resistance to change	7	35
Other	3	15

Source: Survey data collected and processed by the author.

Lack of funding (45%) and internal skills (40%) are main barriers, highlighting the need for grants, training, and tax incentives. Resistance to change (35%) and regulatory constraints (25%) also call for a better institutional framework and awareness.

The exploratory factor analysis enabled the construction of a typology of Tunisian companies according to their level of commitment to sustainability. The following table summarizes the characteristics, barriers, and opportunities associated with these categories:

Table 4. Typology of Tunisian companies and their characteristics

Category	%	Description	Main Barriers	Opportunities / Key Levers
Passive	42	No formal sustainability measures	Weak institutional incentives	Green investment tax credits
Reactive	37	Ad hoc actions under external pressure	International client pressure	Simplified access to green financing
Proactive	21	Strategic and cross-cutting integration of sustainability	Limited local recognition	Creation of national labels for visibility

Source: Survey data collected and processed by the author.

Company strategies form three groups: Innovators (20%), Followers (majority), and Traditionalists (Appendix C, Table C.2). These profiles underline the diversity of approaches adopted by Tunisian companies regarding sustainability. They also reveal their specific needs in terms of institutional support, capacity building, and funding. These observations confirm the conclusions of Sinkovics *et al.* (2014), who note that "institutional voids" hinder the systematic integration of sustainability in companies in developing countries.

2.2 Qualitative Approach: Semi-Structured Interviews

In addition to the quantitative survey, semi-structured interviews were conducted between April and July 2024. This qualitative method made it possible to deepen the understanding of internal dynamics and often implicit patterns of action within Tunisian companies. A total of twenty interviews were carried out with key actors from the Tunisian entrepreneurial ecosystem. The panel included ten business leaders – five of whom were engaged in sustainability initiatives and five who were not – four experts in Corporate Social Responsibility (CSR) and sustainable development, three representatives of Tunisian public institutions, and three representatives of international funding agencies such as GIZ and UNDP.

The diversity of the interview panel was ensured by a balanced distribution of participants among business leaders, CSR and sustainability experts, public sector representatives, and funding agencies. The detailed breakdown of participants by professional category is presented in Appendix D (Table D.2). Interviews were conducted either face-to-face or via video conference, with an average duration of sixty minutes. The interview guide was structured around five main themes: respondents' perceptions of sustainability, strategies implemented within companies, internal and external constraints encountered, the role of stakeholders in sustainability dynamics, and perspectives on future trajectories. Qualitative data were analyzed using NVivo software, following an inductive approach. Interview transcripts were thematically coded, enabling the identification of recurrent themes, divergences, and contextual specificities. This analysis enriched the quantitative results by highlighting subjective and contextual elements often absent from questionnaire responses.

The circular economy, a major theme in interviews, offers Tunisia a way to reduce resource dependence via reuse, recycling, and eco-design. 17% of companies use circular principles (12% recycling, 7% eco-design). Agri-food firms valorize waste, but adoption faces regulatory, funding, and awareness obstacles. Drawing on international models such as the "Noor Ouarzazate" project in Morocco, public-private partnerships, tax credits, and national certification labels could catalyze the adoption of the circular economy in Tunisia. For example, a manager of an industrial SME based in the central region stated: *"We know we should integrate sustainable practices, but without financial support or clear incentives, it's almost impossible."*

This testimony illustrates both the awareness among certain managers and the financial obstacles they face. Another example comes from a sustainable development expert, who emphasized: *"Tunisian companies, especially the smaller ones, view sustainability as an additional cost rather than a long-term investment. There needs to be a shift in mindset, supported by strong public policies."*

This observation highlights a widespread perception that hinders the adoption of sustainable practices, especially among small and medium-sized enterprises. The interviews also revealed generational divergences. A young executive in the technology sector stated: *"For me, integrating sustainability is an opportunity to stand out in the international market. Foreign clients value these practices, and it gives us a competitive edge."*

In contrast, a more experienced leader of an agricultural company expressed reservations: *"Sustainability is good, but our priorities remain survival and profitability. We cannot afford to take additional risks."*

These quotes illustrate contrasting views of sustainability, shaped by age, sector, and managerial experience. Finally, participants unanimously emphasized the importance of stakeholders in sustainability dynamics. A representative of a public institution noted: *"There is a real need for coordination among businesses, public institutions, and funding agencies. Without this, efforts remain isolated and ineffective."*

This comment reflects a systemic issue of fragmented initiatives, frequently mentioned in the discussions.

In conclusion, this qualitative approach provided analytical depth to the quantitative results by illustrating the challenges, perceptions, and opportunities related to the sustainability transition in Tunisian companies. The anonymized quotations from participants strengthen the validity and richness of the analysis by offering varied and contextual perspectives.

2.3 International Comparative Analysis and the Sustainability Transition in Tunisia: SWOT Perspective

To contextualize the Tunisian case within a broader perspective, a comparative documentary analysis was conducted using the SWOT method (Strengths, Weaknesses, Opportunities, Threats). Three countries – France, Germany, and Morocco – as well as a regional MENA perspective, were selected for this analysis. The choice of these countries and the MENA region is based on their geographical, cultural, or economic proximity to Tunisia, as well as their varying degrees of institutional maturity in terms of sustainability. Documentary sources included national and regional sustainable development strategies, public policy evaluation reports, scientific publications, and reports from international organizations such as the OECD, UNIDO, and UNDP. The results of this analysis are summarized in the following table, which is further enriched with specific examples for each country to enhance the relevance of recommendations for Tunisia:

Table 5. Comparative SWOT analysis supporting strategic reflection on the sustainability transition in Tunisia

Country/ Region	Strengths	Weaknesses	Opportunities	Threats
France	Structured regulatory framework, support networks	Administrative complexity	Energy transition, European green market	Inflation, political instability
Germany	Green industry, support for R&D	High labor costs	Technological leadership	Asian competition
Morocco	Clear national strategy, royal backing	Weak CSR culture in SMEs	South-South cooperation	Dependence on donors
Tunisia	Entrepreneurial dynamism, skilled youth	Weak incentives, regulatory instability	International partnerships	Institutional voids
MENA	Abundant natural resources, growing market	Weak institutional frameworks, regional fragmentation	International green financing, regional integration	Geopolitical conflicts, economic instability

Source: Author's own elaboration.

This comparison reveals practices adaptable to Tunisia's context. France's FRET21 (an initiative aimed at reducing the environmental impact of freight transport in France) shows collaboration's value, Germany highlights R&D's role in innovation, and Morocco provides an example of institutional mobilization for renewables (Noor Ouarzazate). In the case of the MENA region, the abundance of natural resources and demographic growth offer unique opportunities, but institutional and geopolitical challenges remain major obstacles to a coordinated and sustainable transition. This regional perspective contributes to the reflection on the institutional and strategic levers needed to accelerate the sustainability transition of Tunisian companies, while strengthening regional collaborations to maximize the impact of initiatives.

3. Research Results and Discussions

Findings show that, while most respondents recognize the importance of sustainability, operational implementation remains limited and fragmented. Recent studies show that the adoption of sustainable practices is directly linked to pressure from international supply chains (Kittinun, 2024). This gap between awareness and concrete action reflects significant structural and institutional constraints. For example, some companies report difficulties accessing green funds despite international commitments or encounter the absence of clear regulations supporting sustainable investments.

3.1 Contribution to Literature

This study contributes to enriching existing literature by providing new theoretical perspectives. It deepens the concept of "institutional voids" within the framework of sustainability transition. These voids – characterized by the absence of clear regulatory frameworks, financial support mechanisms, and fiscal incentives – hinder the adoption of sustainability practices, as confirmed by the work of Sinkovics *et al.* (2014). Unlike advanced economies, where institutional frameworks are generally well established, this study shows that these gaps can slow progress and exacerbate sectoral and generational disparities. Furthermore, the results challenge and enrich two major theoretical frameworks. First, the Triple Bottom Line (TBL) is revisited through the lens of dominant economic priorities in Tunisia, with social and environmental dimensions less integrated. Second, although the principles of the circular economy are mentioned by some companies, their systematic application remains limited. This underscores the need to adapt these frameworks to the specificities of developing countries, where institutional and financial resources are limited. Finally, the study highlights the role of young leaders as key actors in the sustainability transition due to their heightened sensitivity to ESG issues, reinforcing arguments in favor of an intergenerational approach. As mentioned in the introduction, Arab regimes, in response to the 2011 uprisings, adopted repressive and exclusive social pacts, thereby restricting universal economic and social rights and redefining them as selective privileges (Heydemann, 2020). This context broadens our understanding of the structural obstacles observed in Tunisia, particularly regarding limited access to green financing and the absence of fiscal incentives - a finding consistent with dynamics observed in other MENA countries, where companies face similar challenges (OECD, 2021).

3.2 Quantitative Survey Results

Only 38% of surveyed Tunisian companies have a formal CSR policy, similar to Algeria and Egypt (El-Kassar & Singh, 2019). Of these, just 22% publish sustainability reports, usually for foreign partners such as donors or international clients. This dependence on external requirements reflects a sporadic and unsystematic diffusion of sustainability-related information. Tunisian companies focus on visible actions (waste reduction 31%, energy savings 25%); complex practices like eco-design (12%) or stakeholder engagement (14%) are rarer due to higher costs and weak institutional support. These trends are consistent with regional and international dynamics: many companies, though mentioning concepts like the circular economy in their reports, struggle to integrate them fully into their strategies (Opferkuch *et al.* 2022). The following table summarizes the main sustainable practices, their adoption frequency among Tunisian companies, and their perceived positive impact:

Table 6. Sustainable practices, adoption frequency, and perceived impact

Sustainable Practice	Description	Adoption Frequency (%)	Perceived Positive Impact (%)
Waste reduction	Strategies to minimize waste	31	75
Energy savings	Measures to reduce energy consumption	25	70
Internal recycling	In-company recycling processes	21	65
Diversity policy	Promoting diversity and equality	19	50
Stakeholder dialogue	Collaboration with stakeholders	14	80
Eco-design	Environmentally friendly product design	12	65
Other local initiatives	Local initiatives and philanthropy	9	60

Source: Survey data collected and processed by the author.

These results show that Tunisian companies prioritize short-term strategies offering immediate benefits, notably in terms of operational cost reduction. However, this approach limits the development of long-term initiatives, such as eco-design or the circular economy, which could strengthen their competitiveness in the international market. Wider adoption requires strong institutional support, financial incentives, targeted training, and better awareness of sustainability's benefits (Hanna *et al.* 2023).

The stakeholder priorities identified in this study highlight diverse motivations. Awareness-raising (80%), brand image enhancement (65%), and the adoption of renewable energy (60%) are among the main strategic priorities of the interviewed leaders and experts. These priorities are reinforced by pressure from international partners and the desire to innovate, although the latter remains less prioritized (35%). Table 7 summarizes these priorities.

These figures indicate a still limited adoption of advanced environmental practices. The absence of a systemic transformation in the strategies of Tunisian companies is constrained by organizational barriers and a lack of institutional support.

Table 7. Stakeholder priorities in the sustainability transition

Priority/ Motivation	Business Leaders (%)	Experts (%)	Public Institutions (%)	Donors (%)	Average (%)	Key Observations
Awareness-raising	80	90	80	70	80	Main priority for collective engagement
Social responsibility	50	80	70	80	70	Required by international partners
Renewable energy	70	60	60	50	60	Strategic opportunity in the Tunisian context
Brand image	70	80	60	50	65	Important for exporting companies
Waste reduction	60	70	50	40	55	Initiative that can strengthen ecological practices
Technological innovation	40	50	30	20	35	Low priority due to high initial costs

Source: Survey data collected and processed by the author.

In the MENA region, the adoption of green technologies and practices within companies is influenced by both organizational and institutional factors. A study by Ayouni and Zouiri (2024) shows that proactive environmental management, supported by environmental regulation, plays a decisive role. Financial exposure to environmental obstacles acts as a moderator, revealing complex relationships between financial constraints and the adoption of green technologies and practices. These results underscore the importance of appropriate institutional frameworks to encourage sustainable practices in companies. In this context, indicators such as the Just Transition Score, proposed by Htitich (2024), could enable a comprehensive assessment of social and environmental sustainability at the country level. In Tunisia, such measures, combined with institutional reforms and targeted incentives, are essential to accelerate the adoption of sustainable practices and transform current obstacles into economic and strategic opportunities.

3.3 Qualitative Interview Results

Interview data nuanced the survey results and revealed internal dynamics. Many leaders want to transition to sustainability but face structural barriers. Among these are a lack of access to green financing, the absence of appropriate tax incentives, and a regulatory framework considered unclear and not sufficiently supportive. A manager of an industrial SME based in Sfax stated: *"We want to do well, but there is little concrete support. And our local clients are not yet sensitive to these arguments."*

This testimony highlights the gap between the willingness to act and the economic and institutional reality. Moreover, several interviewed experts pointed out the fragmentation of public policies related to sustainability. Existing mechanisms are often poorly coordinated, and their implementation remains largely centralized, with insufficient involvement from local authorities. To address these institutional voids, it would be relevant to propose specific reforms, such as the creation of a simplified regulatory framework to encourage SMEs to adopt sustainable practices. Furthermore, tax incentives, such as tax credits for green investments or subsidies for energy audits, could catalyze broader adoption of sustainable practices in Tunisia. Another important observation concerns the difference in approach between generations. Younger leaders seem much more attuned to ESG issues and the opportunities offered by sustainable innovation.

An expert based in Morocco noted: *"The future of sustainability in the region depends on the younger generation, who are more open to responsible innovation."*

This generational shift could be a medium-term driver of transformation.

These results are in line with the work of Hahn *et al.* (2016), who stress the importance of strategic leadership in promoting organizational sustainability. They highlight that young leaders, thanks to their increased sensitivity to ESG issues, could play a central role in developing more responsible and innovative business models.

3.4 International Comparative Analysis Results

The SWOT-based comparative analysis shows Tunisia's institutional lag, mainly due to unclear regulations, weak subsidies, and lack of policy evaluation. These gaps limit the capacity of Tunisian companies to fully engage in sustainable practices.

The comparison of regulatory frameworks for sustainability highlights marked differences among the countries studied. While France and Germany have structured frameworks with strong institutional support, Morocco and Tunisia are characterized by emerging mechanisms and specific challenges. A comparison of regulatory frameworks and levels of sectoral engagement in different countries illustrates these disparities. The table below summarizes the strengths, weaknesses, and engagement levels observed in France, Germany, Morocco, and Tunisia:

Table 8. Regulatory frameworks, strengths, weaknesses, and sectoral engagement levels

Country/ Sector	Regulatory Framework	Strengths	Weaknesses	Engagement Level (%)
France	Structured	Support networks	Administrative complexity	Industry: 40
Germany	Structured	Support for R&D	High labor costs	Services: 35
Morocco	Emerging	Royal backing	Weak CSR culture in SMEs	Agriculture: 25
Tunisia	Emerging	Entrepreneurial dynamism	Weak incentives, regulatory instability	-

Source: Author's own elaboration.

This table shows that countries like France and Germany benefit from well-structured frameworks that foster innovation and the adoption of sustainable practices through support networks and substantial R&D investments. These frameworks pose administrative and financial challenges, particularly for SMEs.

Conversely, emerging countries such as Morocco and Tunisia display promising entrepreneurial dynamism but suffer from institutional weaknesses, notably a lack of CSR culture in SMEs and limited financial incentives. Morocco, however, has distinguished itself through ambitious initiatives within its National Sustainable Development Strategy (NSDS), offering a possible model for Tunisia.

3.4.1 The Case of Morocco: A Promising Regional Model

In comparison, Morocco stands out for significant progress through international partnerships and a strategic vision promoted at the highest level of the State, particularly through the National Sustainable Development Strategy (NSDS). Although it shares certain structural constraints with Tunisia, Morocco has effectively mobilized stakeholders around common objectives through targeted and better-coordinated public policies.

According to research by Sakhraoui *et al.* (2024), Morocco has significantly reduced its dependence on fossil fuels by investing in renewable energy, especially solar and wind. Since 2009, large-scale projects have been implemented, recently followed by decentralized initiatives such as MG-Farms, enabling the country to reach 38% renewable energy in 2022. To reinforce this analysis, it would be relevant to integrate concrete examples such as Moroccan initiatives in renewable energy, notably the Noor Ouarzazate solar project. Details on how Morocco managed funding and mobilized local actors could provide valuable lessons for Tunisia.

Nevertheless, challenges remain, notably centralized governance and limited engagement of local stakeholders. Greater decentralization and a more robust institutional framework would be necessary to sustain these advances and offer a reproducible model for other emerging economies, including Tunisia.

3.4.2 European Lessons: Innovation and Collaboration

In Europe, the European Green Deal constitutes a major strategic framework aiming for carbon neutrality by 2050. A recent study on the Visegrád Group (Poland, Hungary, Slovakia, and the Czech Republic) by Kwilinsk *et al.* (2025) reveals that technological innovation plays a key role in ecological transition and green economic growth. However, this study also highlights significant disparities between these countries, requiring tailored policies to maximize the benefits of innovation.

In France, it would be relevant to deepen the analysis of programs such as FRET21 or the energy renovation plan. These initiatives have helped reduce CO2 emissions while fostering collaboration between companies and public authorities. Simplifying these models to adapt them to the Tunisian context could be an effective lever for transformation. Touratier-Muller and Ortas (2021) show that the FRET21 program, aimed at sustainable freight transport, improved stakeholder collaboration, although corporate efforts relied more on internal dynamics than on regulatory constraints. These lessons are pertinent for Tunisia, where similar initiatives could be implemented to promote a sustainable transport system.

Nadel and SavèsMarra (2025) add that corporate governance plays a key role in promoting green investments. Their study, conducted on the French manufacturing industry, reveals that the adoption of sustainable management tools is more effective than the symbolic integration of stakeholders for fostering decisions aligned with sustainability objectives. These findings highlight the need for companies, including in Tunisia, to move beyond symbolic approaches and implement structural reforms to effectively align ecological and social interests.

In Germany, strong technological leadership and substantial support for research and development are major assets. However, the country faces difficulties in mobilizing SMEs in the ecological transition. This observation underscores the importance for Tunisia of supporting innovation among small businesses while adapting accessible reporting standards to encourage their participation. Filho *et al.* (2025) showed that the adoption of European sustainability reporting standards (ESRS) enabled the standardization of transparency in the performance of European companies, but SMEs suffer from a lack of resources and support. These conclusions offer pathways to structure sustainability practices in Tunisia, with specific support for medium-sized and small enterprises.

3.4.3 Contributions from the MENA Region: Common Challenges and Opportunities

A recent study by Senturk *et al.* (2025) conducted in 12 MENA countries analyzes the effects of the subcomponents of economic freedom on the load capacity factor (LCF). The results show that elements such as judicial efficiency and economic freedoms (business, trade, investment) improve LCF, while monetary and financial freedom have negative effects. This underlines the importance of appropriate economic frameworks and structural reforms for successful sustainable transitions in this region. These findings are also applicable to Tunisia, where institutional reforms and targeted incentives could catalyze sustainable transitions. For example, Morocco's efforts in renewable energy demonstrate that international partnerships and targeted investments can transform environmental challenges into economic opportunities.

3.4.4 Global Perspectives: Transferable Lessons

In other contexts, such as Thailand, strategic and holistic approaches have been adopted in certain sectors, such as the cosmetics industry. Suphasomboon and Vassanadumrongdee (2023) show that multinational companies in this country have integrated sustainability into their activities, unlike small local firms, which lack resources and an understanding of life cycle impacts. These findings highlight the importance of enhancing the transparency of business practices and consumer trust through mandatory sustainability reporting, expanded regulations, and financial incentives. These measures provide interesting pathways for Tunisia, where similar regulatory and resource challenges hinder sustainable transitions. Finally, according to Marra *et al.* (2024), the availability of natural resources influences how countries approach the sustainability transition. In countries with low resource depletion, such as Tunisia, sustainability relies on historical trajectories, but these countries do not benefit as much from the positive effects of structural and technological change as do countries with high resource depletion. These results reinforce the necessity for Tunisia to implement strategic management of its natural resources and to reduce economic inequalities to succeed in its ecological transition.

3.4.5 Synthesis of Results and Recommendations

This study examines the challenges and dynamics facing Tunisian companies in their transition towards sustainable practices. To connect results to recommendations and international best practices, analysis is provided at both international and Tunisian levels.

3.4.5.1 International Comparative Perspective

The table below summarizes the strengths, weaknesses and recommendations resulting from the analysis of international approaches:

Table 9. Comparative SWOT analysis and recommendations for Tunisia

Country/ Region	Strengths & Advances	Weaknesses & Challenges	Recommendations for Tunisia
MENA (incl. Morocco)	- Green energy projects (Morocco: 38% renewable energy in 2022) - International partnerships - Economic freedoms supporting resilience	- Centralized governance (Morocco) - Limited local stakeholder engagement - Lack of adapted regulatory frameworks - Weak fiscal and financial incentives	- Encourage decentralization of initiatives - Reform institutional frameworks - Introduce targeted fiscal incentives, especially for SMEs - Mobilize stakeholders around common objectives

Europe	- European Green Deal (carbon neutrality by 2050) - Technological leadership (Germany) - Structured public policies (France) - Advanced reporting standards - Collaborative programs (*e.g.*, FRET21)	- Administrative complexity (France, a barrier for SMEs) - Difficulties mobilizing SMEs (Germany) - Regional and generational disparities in ecological engagement	- Simplify administrative processes for SMEs - Support SME innovation with targeted incentives - Develop policies tailored to Tunisian specificities - Promote standard tools for measuring environmental impacts
Other (Thailand, etc.)	- Strategic approaches in sectors like cosmetics - Importance of mandatory reports and transparency	- Lack of resources for local companies - Regulatory gaps	- Enhance transparency in sustainable practices - Develop financial incentives for emerging industries

Source: Author's own elaboration.

3.4.5.2 Focus on Tunisian Specificities

The following table links specific observations in Tunisia to concrete recommendations, enriched by international inspirations adapted to the local context.

Table 10. Link between Tunisian observations, concrete recommendations, and international inspirations

Observed Results	Examples from Collected Data	Proposed Recommendations	International Inspiration
42% "passive" companies do not adopt sustainability	*"Our priorities remain survival and profitability."* (Manager of an agricultural SME)	Implement fiscal mechanisms such as tax credits for green investments	France: Tax credits for building energy renovation
Lack of coordination among companies, public institutions, and donors	*"Efforts remain isolated and ineffective without coordination."* (Public sector representative)	Establish collaborative platforms for sharing best practices and fostering partnerships	France: Collaborative programs like FRET21 for CO_2 reduction in transport
37% "reactive" companies act under external pressure (international clients)	*"Our European clients impose sustainable standards, but locally, there is no support."* (Industrial manager)	Simplify access to green finance with a one-stop shop for SMEs	Germany: Public support for green innovation via specialized agencies
Financial barriers perceived by SMEs as a major obstacle to adopting sustainable practices	*"Without financial support or clear incentives, it's almost impossible."* (Industrial SME manager)	Offer low-interest credit lines for small businesses	Germany: Subsidies for solar and wind energy projects
21% "proactive" companies integrate sustainability strategically	*"Integrating sustainability is an opportunity to stand out in the international market."* (Young tech leader)	Create national labels and awards to highlight pioneering companies	Morocco: Labels for renewable energy projects (*e.g.*, Noor Ouarzazate)
Absence of a strategic and stable vision in Tunisian institutions	*"A mindset change supported by strong public policies is needed."* (Sustainable development expert)	Develop a clear and coherent regulatory framework to enhance institutional stability	Morocco: National Sustainable Development Strategy (NSDS)
Need for clear indicators to measure progress in sustainable initiatives	*"We don't really know how to measure the impact of our efforts."* (Agricultural SME manager)	Create specific indicators and publish annual reports on sustainability progress	OECD: Recommendations on using indicators to track environmental performance
Generational differences in perceptions of sustainability	Young leaders see sustainability as a strategic lever, while experienced managers focus on immediate profitability	Develop cross-generational mentoring programs	USA: Intergenerational mentoring to foster SME innovation

Source: Author's own elaboration.

These results confirm the conclusions of Schröder *et al.* (2019), who emphasize the importance of strong institutional frameworks to mobilize stakeholders around sustainability. Tunisia must overcome institutional fragmentation and promote an inclusive vision of sustainability, involving businesses, public authorities, educational institutions, and civil society.

To accelerate the sustainable transition, it is essential to support Tunisian companies by strengthening financing mechanisms and institutional frameworks. A one-stop shop could simplify access to green finance and subsidies, particularly for SMEs. Furthermore, the integration of mandatory environmental audits for medium and large companies would help standardize sustainability efforts. International collaborations are also a key lever for promoting technology transfer and the sharing of best practices. Inspired by examples such as Morocco's renewable energy initiatives, Tunisia could also develop national labels to promote circular companies and their innovations. Finally, the establishment of national indicators to measure reductions in waste, CO_2 emissions, and energy consumption would enhance transparency and encourage companies to intensify their efforts.

A co-construction and shared governance approach would ensure a sustainable transition tailored to local realities and inspired by international best practices. Free environmental audits, training, and sharing platforms would accelerate the sustainable transition. Inspired by Moroccan and European examples, these measures would help structure a framework adapted to the Tunisian context and encourage local innovation.

3.5 Link between Results and Recommendations

The results of this study combine quantitative and qualitative data to provide a comprehensive analysis of sustainable practices in Tunisian companies. This cross-approach highlights both convergences and divergences between the two types of data, justifying the recommendations made. Qualitative observations enrich the quantitative findings by offering explanations for the statistical figures. For example, quantitative data show that 31% of companies reduce their waste, but only 17% integrate circular economy principles. Qualitative interviews reveal that this limited adoption is linked to financial and institutional obstacles. A manufacturing sector leader stated: *"Recycling is expensive and not profitable without subsidies."* These insights explain why the figures remain modest despite increased awareness. Similarly, the 37% of companies classified as "reactive" in the quantitative data are echoed in qualitative testimonies. These companies take ad hoc measures, mainly in response to external pressures. An industrial company executive explained: *"We started investing in sustainable practices only because our European clients demanded it."* This complementarity between quantitative and qualitative data allows for a clear identification of the external motivations influencing these behaviors. The recommendations from this study are directly justified by the data collected. Qualitative observations highlight marked generational divergences in the perception and adoption of sustainable practices. Young leaders are more sensitive to ESG issues and see sustainability as a long-term strategic opportunity. In contrast, more experienced leaders often prioritize immediate profitability and express reluctance to invest in sustainable initiatives due to economic uncertainty. For example, a tech entrepreneur stated: *"Environmental issues are not just a constraint, but an opportunity to stand out in the international market."* Conversely, an agricultural SME manager said: *"Our priorities remain survival and profitability. Sustainability is a luxury we cannot afford."* These divergences justify the establishment of intergenerational mentoring programs. Such programs would allow young leaders to share their vision and innovative practices with more experienced generations, while benefiting from their operational and strategic expertise. This synergy could not only reduce internal resistance but also accelerate the adoption of sustainable models in Tunisian companies by aligning strategic priorities with long-term perspectives. The data also show that 21% of companies surveyed take a proactive approach, strategically integrating sustainability into their business models. These companies, often led by young leaders, stand out for their willingness to comply with international standards and position themselves as exemplary actors in their sector. However, the same qualitative data reveal that these efforts remain largely invisible nationally, due to a lack of institutional recognition or local valorization. A proactive company manager said: *"We invest in sustainability to satisfy our international partners, but there is no advantage or recognition locally."*

In this context, the introduction of national labels could fill this gap. These labels would offer several advantages. First, they would recognize and incentivize pioneering companies, thus strengthening their visibility and credibility in the national market. Then, they would create a ripple effect by encouraging other companies to adopt sustainable practices, highlighting the competitive advantages gained. Finally, unlike other international mechanisms often perceived as inaccessible, these national labels would be designed to reflect local specificities, especially economic and institutional constraints. The success of Moroccan initiatives, such as labels for renewable energy projects (*e.g.*, Noor Ouarzazate), illustrates the effectiveness of such recognition in similar contexts. In Tunisia, these labels could play a key role in structuring a sustainable ecosystem and mobilizing local stakeholders around common objectives. The recommendations proposed in this study are not generic solutions, but measures directly justified by the data collected. Intergenerational mentoring programs address the generational divergences observed, while national labels offer a response adapted to the needs for recognition and valorization of pioneering companies. These initiatives, rooted in Tunisian realities, aim to transform the identified obstacles into opportunities to accelerate the transition to sustainable practices.

3.6 Study Limitations

Despite providing an in-depth analysis, the study has methodological limitations, notably sampling bias. The 120-company sample, while useful for trends, is limited for robust national analysis. Since 68% of the sample are exporting SMEs, results may be biased toward practices shaped by international pressures; local-market companies are underrepresented. Another significant bias lies in the self-selection of surveyed companies. Businesses already aware of sustainability issues or with relevant experiences are more likely to participate in surveys and interviews. This can lead to an overestimation of sustainable practices within the studied sample. While these biases do not negate the relevance of the results, they should be considered in interpretation. These limitations also highlight the need for complementary methodological approaches to enrich future results and better reflect the realities of Tunisian companies.

3.7 Methodological Limitations and Improvement Perspectives

Beyond sampling-specific biases, this study presents more general methodological limitations worth discussing for future research improvements. Quantitative surveys, while efficient for identifying broad trends, are subject to response biases, especially when respondents aim to present their company favorably. Qualitative interviews, though rich in contextual details, are influenced by participant subjectivity, which can limit the generalization of findings. Additionally, the absence of a longitudinal approach prevents capturing the evolution of sustainable practices over time, limiting the understanding of change dynamics. To overcome these limitations, several improvement avenues can be considered. First, diversifying the sample to include more locally operating firms, as well as micro-enterprises and informal economy actors, would better represent the Tunisian economic landscape. Next, a longitudinal approach, following the same companies over several years, would offer a more complete perspective on triggers and obstacles to sustainability. Additionally, triangulating data by cross-referencing questionnaire and interview results with secondary data such as financial reports or environmental certifications would strengthen the robustness of conclusions. Finally, implementing incentive mechanisms, such as offering participants personalized results or practical recommendations, could encourage the participation of less aware actors, thus reducing self-selection biases. These methodological proposals aim to transform current limitations into improvement opportunities. They lay the groundwork for future, more robust and representative research, contributing to a deeper understanding of sustainability dynamics in Tunisian companies.

Conclusion

The study shows a significant gap between Tunisian companies' sustainability awareness and actual implementation, mainly due to unclear regulations, insufficient incentives, and poor stakeholder coordination. These "institutional voids," observed in several MENA countries, require tailored solutions to transform these challenges into strategic opportunities. To overcome these obstacles, it is imperative to implement a coherent national strategy aligned with sectoral priorities, with clear laws and fiscal mechanisms such as tax credits for green investments. Simplifying access to green finance, notably through one-stop shops for SMEs, could reduce administrative barriers. SMEs, which play a central role in the Tunisian economy, require specific measures to support their transition to sustainability. This could include free environmental audits, specialized training, and collaborative platforms for sharing best practices. Furthermore, initiatives such as national labels or awards for sustainable innovations would enhance the visibility of pioneering companies. Finally, to ensure the effectiveness of the actions undertaken, it is crucial to establish monitoring and evaluation mechanisms. This includes defining specific indicators to measure progress, publishing annual sustainability reports, and holding regular stakeholder consultations. Inspired by successful models, such as those in Morocco or Europe, Tunisia can capitalize on its entrepreneurial dynamism to accelerate its sustainable transition. In sum, the sustainability of Tunisian companies represents a complex challenge but also a major strategic opportunity. With dynamic youth, entrepreneurship, and a structured approach, Tunisia can overcome constraints and become a model for emerging economies.

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Credit Authorship Contribution Statement

Mohamed Farhoud: Conceptualization, Investigation, Methodology, Data collection, Software, Formal analysis, Writing – original draft, Visualization.

Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The author declares that he has not used generative AI and AI-assisted technologies during the preparation of this work.

Appendices

List of Acronyms and Abbreviations

1. **UNDP**: United Nations Development Programme.
2. **OECD**: Organisation for Economic Co-operation and Development.
3. **GIZ**: The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
4. **UNIDO**: United Nations Industrial Development Organization.

Appendix A – Survey Questionnaire

<table>
<tr><th>Sections</th><th>Questions</th></tr>
<tr><td>1: General Information</td><td>1.Sector of activity:
❒ Industry
❒ Services
❒ Agriculture
❒ Other (please specify): ....
2.Company size:
❒ <10 employees
❒ 10–49 employees
❒ 50–249 employees
❒ >250 employees
3.Location: ....
4.Year of establishment: ....</td></tr>
<tr><td>2: Governance and Social Responsibility</td><td>1.Does your company have a formalized Corporate Social Responsibility (CSR) policy?
❒ Yes (since which year?): ....
❒ No
2.If yes, which areas are covered? (multiple answers possible)
❒ Waste reduction
❒ Energy efficiency
❒ Social inclusion and professional equality
❒ Stakeholder dialogue
❒ Other (please specify):..
3.Do you publish a sustainability report?
❒ Yes
❒ No</td></tr>
<tr><td>3: Environmental Practices</td><td>1.Have you integrated circular economy practices?
❒ No
❒ Yes
2.If yes, which ones? (multiple answers possible)
❒ Material recycling
❒ Eco-design of products
❒ Reduction of energy consumption
❒ Reduction of CO_2 emissions
❒ Other:..</td></tr>
<tr><td>4: Motivations and Obstacles</td><td>1.What are your main objectives for adopting sustainable practices?
Questions (Likert scale from 1 to 5 (1 = Not important, 5 = Very important))
Enhance brand image ❒ ❒ ❒ ❒ ❒
Meet client requirements ❒ ❒ ❒ ❒ ❒
Access to new markets ❒ ❒ ❒ ❒ ❒
Cost reduction ❒ ❒ ❒ ❒ ❒
Personal commitment of the manager ❒ ❒ ❒ ❒ ❒
2.What are the main obstacles encountered?</td></tr>
</table>

	❒ *Lack of funding* ❒ *Lack of internal skills* ❒ *Regulatory constraints* ❒ *Others (please specify):*
5: Future Outlook	*Do you plan to strengthen your sustainability actions?* ❒ *Yes, within the year* ❒ *In the medium term (2–5 years)* ❒ *No*

Thank you for your participation!

Appendix B – Semi-structured Interview Guide

Themes	Interview objectives
Introduction: Presentation of the interview objective	• Understanding the internal and external dynamics influencing the sustainable transition of Tunisian companies. • Guarantee the confidentiality of responses and explain the use of the data.
1: Understanding of Sustainability	• How do you define sustainability in your sector of activity? • In your view, what are the strategic advantages of integrating sustainable practices?
2: Sustainable Practices and Circular Economy	• What concrete actions have you implemented in terms of sustainability? • Have you adopted circular economy principles (*e.g.*, recycling, eco-design)? If yes, can you provide examples?
3: Internal and External Levers	• What internal levers have facilitated your sustainable transition? (Leadership, innovation, corporate culture...) • What are the most useful external levers for you? (Access to funding, international partnerships...)
4: Challenges Encountered	• What are the main barriers to implementing sustainable practices in your company? ✓ Institutional (regulation, funding...) ✓ Cultural (resistance to change, lack of awareness...)
5: Future Outlook	• In your opinion, how could Tunisia better support companies in their sustainable transition? • What are your medium-term sustainability objectives (2–5 years)?

Thank you for your participation and valuable contributions!

Appendix C: Statistical Analyses and Additional Results

1. Assessment Test of the Association between Company Size and Engagement

Table C.1: Chi-square Test on the Association between Company Size and Engagement

Level of Engagement	Weakly Engaged	Moderately Engaged	Proactively Engaged	Total
Observed	50	45	25	120
Expected	42	42	36	120
Chi-square: 8.76; df: 2; p-value: 0.012				

Source: Survey data collected and processed by the author.

This table presents the results of the Chi-square test assessing the association between company size and their level of engagement in sustainability. The results show a statistically significant association (p-value = 0.012), indicating that company size influences the degree of engagement.

2. Classification of Companies Based on Characteristics and Sustainability Strategy

Table C.2: Cluster Analysis of Companies by Sustainability Strategy

Cluster	Main Characteristics	% of Companies
Innovators	Strong R&D investment, rapid adoption of green tech	20%
Followers	Moderate adoption, wait for evidence before investing	50%
Traditionalists	Low adoption, focus on short-term cost reduction	30%

Source: Survey data collected and processed by the author.

This table groups companies into three distinct clusters according to their characteristics and sustainability strategy. "Innovators" represent 20% of companies, while the majority (50%) fall into the "Followers" group.

3. Assessment of Correlations between Governance, Environmental, and Social Scores

Table C.3: Pearson Correlation Matrix

Variable	Environmental Score	Social Score
Governance Score	0.45*	0.32*
Environmental Score		0.61*

Source: Survey data collected and processed by the author.

This matrix presents the correlations between governance, environmental, and social scores. Correlations significant at the 0.05 level are marked with an asterisk.

4. Exploratory Factor Analysis

Table C.4: Exploratory Factor Analysis (Explained Variance and Factor Loadings)

Explained Variance

Factor	Eigenvalues	Explained Variance (%)	Cumulative Variance (%)
1	3.2	40.0	40.0
2	1.8	22.5	62.5
3	1.2	15.0	77.5

Factor Loadings

Variable	Factor 1	Factor 2	Factor 3
Sustainable Governance Score	0.75	0.30	0.10
Environmental Score	0.60	0.50	0.20
Social Score	0.40	0.70	0.30

Source: Survey data collected and processed by the author.

The results of the exploratory factor analysis show that three factors explain 77.5% of the total variance. Factor loadings for each variable are also presented.

Appendix D: International Comparisons and Participant Profiles

1. Distribution of Participants by Category

Table D.1: Distribution of Participants by Category

Category	Number of Participants	Percentage (%)
Business leaders	10	50
CSR and sustainable development experts	4	20
Public sector representatives	3	15
Donor representatives	3	15
Total	20	100

Source: Survey data collected and processed by the author.

The following table presents the distribution of participants by professional category.

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Saving Hidden Paradise: An Analysis of Sustainable Tourism Communication Needs for the Conservation of the Sawarna Beach Ecosystem, Indonesia

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Abstract: Tourism is recognized as an important sector for the national economy, with significant contributions to GDP and foreign exchange earnings. This study was conducted under the auspices of Sawarna Beach as a result of increased tourism contributing to the economic growth of the local ecosystem and the general population. This study aims to analyze the communication needs of sustainable tourism that can support the preservation of the Sawarna Beach ecosystem. The method used is a case study with qualitative approach. Data were obtained from observations, study documentation, focus group discussions (FGD), and interviews. Collaboration among various stakeholders in Sawarna Beach, including district government, BUMDes, business owners, NGOs, Lebak Regency government, media, and academics, is crucial for promoting sustainable agriculture and environmental conservation. In addition, each group has specific communication needs, such as discussion forums for district officials, information sheets for tour operators, training programs for tour guides and accommodation owners, as well as storage and information areas for tourists for tour guides. This study also suggests that effective education thru social media and academic materials is crucial for enhancing participation and sustainable environmental maintenance. All of this significantly contributes to the development of stricter and more sustainable tourism practices in ecologically sensitive areas.

Keywords: sustainable tourism; communication needs; conservation; Sawarna Beach; community involvement.

JEL Classification: Q57; L83; Q28; D83; O13; R11.

Introduction

In Indonesia, the tourism sector is a significant contributor to the national economy, although specific figures regarding its contribution to GDP can vary. The World Travel & Tourism Council (WTTC) reported that the tourism sector contributed approximately 5.25% to the national GDP prior to the pandemic, qualifying its role as a major source of foreign exchange through tourism receipts (Putranto *et al.,* 2023; Lukman *et al.,* 2022). The tourism sector not only increases national income but also plays an important role in empowering the local economy through job creation and increasing the income of the surrounding community.

One of the tourist destinations with great potential is Sawarna Beach, located in Lebak Regency, Banten Province. During the Nataru holiday period in 2024, the Sawarna Beach area attracted between 40,000 to 50,000 visitors, demonstrating its significant appeal as a tourist destination (Nurabidin, 2024). Of course, this condition presents an opportunity for the community, especially business operators in Sawarna Beach, to increase their income.

However, this great potential also brings serious challenges, especially related to environmental impacts. The increasing number of tourist visits to Sawarna Beach has caused serious waste problems, which have the potential to damage the sensitive beach ecosystem (Ganiem & Pandjaitan, 2020). This condition not only threatens environmental health but also affects the quality of the tourist experience, which in turn can negatively impact the local economy.

Previous research shows that the accumulation of waste can reduce the number of tourist visits and harm the local economy, such as souvenir craftsmen, stall owners, and accommodation and transportation staff (Ganiem & Pandjaitan, 2020). On the other hand, communication media, including digital platforms, can play an important role in raising environmental awareness among tourists and supporting efforts to preserve coastal ecosystems (Inayah & Istiqomah, 2020). In addition, collaboration and communication between villages, guides, and accommodations are also crucial in minimizing the negative environmental impacts of tourism (Ruscitasari, 2023).

The main issue raised in this research is how to formulate effective sustainable tourism communication needs to support the conservation of the Sawarna Beach ecosystem. This research aims to understand the communication needs necessary to develop programs that can promote ecosystem sustainability, reduce the negative impacts of tourism, and enhance community participation in environmental preservation. Through this approach, it is hoped that the government and tourism stakeholders can design more effective strategies to maintain environmental sustainability while still leveraging the economic potential of the tourism sector.

The solutions proposed through this research include several strategic steps to support sustainable tourism. First, the research will focus on identifying relevant stakeholders in the tourism and ecosystem conservation sectors. Next, an in-depth analysis will be conducted regarding the communication needs required for ecosystem conservation, as well as the challenges that may arise in the process. Additionally, this study will also explore the perceptions of local communities and tourists towards sustainable tourism and environmental conservation through Focus Group Discussions (FGD).

Various previous studies have highlighted the importance of communication in sustainable tourism. Ganiem & Panjaitan (2020) identified several communication issues at Sawarna Beach, including the lack of community empowerment, communication gaps, and limited communication channels (Ganiem & Panjaitan, 2020). Tomohardjo *et al.* (2021) emphasize the importance of institutional communication to enhance community awareness and capacity but note a decline in tourist visits during the pandemic (Tomohardjo *et al.,* 2021). Research by Jones & Walmsley (2022) reveals the potential of the tourism sector to harm the environment if not managed properly, while Font *et al.* (2017) highlight the need for local stakeholder involvement to support tourism sustainability (Jones & Walmsley, 2022; Font *et al.,* 2017).

The novelty of this research lies in its focus on analyzing the communication needs of sustainable tourism specific to the conservation of the Sawarna Beach ecosystem, which has not been extensively explored in previous studies. By identifying relevant stakeholders, analyzing communication needs, and exploring the perceptions of local communities and tourists, this research offers a more comprehensive and contextual approach to supporting sustainable tourism at Sawarna Beach. Additionally, this research develops effective communication strategies to promote environmental awareness and community participation in ecosystem conservation, thus making a significant contribution to the development of sustainable tourism in Indonesia.

This research is very important to conduct, considering that the analysis of communication needs in sustainable tourism is crucial for conveying clear information, reducing conflicts among stakeholders, and addressing environmental issues such as pollution. Identifying stakeholders and conflict areas facilitates beneficial resolutions (Kalalo & Setiawan, 2023). The participation of local communities and collaboration among stakeholders is also important, especially in the post-COVID-19 economic recovery. Social capital plays an important role in conflict resolution and the promotion of sustainable practices (Rianty *et al.,* 2024). By understanding communication needs, strategies can be developed to effectively support sustainable tourism.

1. Literature Review

1.1. Sustainable Tourism and Environmental Conservation

Sustainable tourism is an important approach in the development of tourist destinations, especially in sensitive ecosystems like Sawarna Beach. According to Font *et al.* (2017), sustainable tourism not only focuses on economic benefits but also on environmental preservation and the empowerment of local communities. In Indonesia, the tourism sector contributes 5.25% to the national GDP and serves as a significant source of foreign exchange (Putranto *et al.,* 2023; Lukman *et al.,* 2022). However, the increase in the number of visitors to Sawarna Beach, reaching 40,000 to 50,000 people during Nataru 2024, poses serious challenges related to environmental impact, particularly the issue of waste that can damage the beach ecosystem (Ganiem & Pandjaitan, 2020). Therefore, it is important to develop strategies that support environmental conservation while harnessing the economic potential of tourism.

Sawarna Beach faces environmental challenges, particularly the accumulation of waste due to the increase in visitors. Ganiem & Pandjaitan (2020) noted that this issue can damage the coastal ecosystem and reduce the quality of the tourist experience. This research highlights the importance of effective communication to raise environmental awareness among tourists and the local community (Goboro *et al.,* 2025).

1.2. The Need for Communication in Sustainable Tourism

Sustainable tourism in Sawarna Beach requires an effective communication system to bridge the interests of various stakeholders. Ganiem & Panjaitan's (2020) research revealed that the communication gap between the village government, business actors, and the community is a major obstacle in environmental management. Regular discussion forums and clear communication channels are needed to align conservation programs with practical needs. Inayah & Istiqomah (2020) emphasize the importance of digital media as a means of educating tourists, considering that 78% of Sawarna's visitors come from the younger generation who are active on digital platforms.

Communication needs are also specific according to the role of each stakeholder. The village government requires technical guidelines on waste management, while business operators need communication training to convey conservation values to tourists (Ruscitasari, 2023). Tourists also need real-time information about waste disposal points and environmental regulations through digital information boards and mobile applications. The integration between formal and informal communication is key to creating a holistic communication ecosystem (Chen & Cheng, 2023). By integrating real-time data, such boards can update visitors about the availability of waste disposal options, which can help manage littering behavior. Such interactive displays are known to be effective in increasing tourist engagement thru enhanced situational awareness (Yang, 2025).

1.3. Community and Tourist Participation

The active participation of local communities and tourists is crucial in supporting the success of sustainable tourism at Sawarna Beach. According to Mahiddin (2023), environmental education that involves the community can raise awareness of environmental issues and encourage their participation in conservation activities. Activities like beach cleanups and conservation training strengthen the bond between the community and tourists. This can increase community involvement in conservation, making them more invested in the ecosystem.

Tourists also play an important role in supporting the sustainability of tourism. Ginting *et al.* (2020) show that tourists are increasingly aware of the importance of environmentally friendly practices and tend to choose destinations that support conservation initiatives. However, they often face obstacles such as a lack of information and limited choices regarding sustainable options (Arcana *et al.,* 2021). Therefore, it is important to create communication channels that allow tourists to participate in conservation activities.

1.4. Communication and Education Strategies in Supporting Sustainable Tourism

Digital media-based communication strategies have proven effective in raising environmental awareness. Gulati's research (2021) shows that platforms like Instagram and TikTok can be used to disseminate educational content about beach conservation. At the community level, environmental education programs need to be developed participatively, involving community leaders as agents of change (Farsari, 2022).

The integration of traditional and modern technology is the key to the sustainability of the program. Dewi & Roziqin (2022) found that digital information boards at strategic points on the beach can increase visitor compliance with cleanliness rules. Such integration of modern technology with traditional environmental management practices can lead to better ecological outcomes, as demonstrated by research linking circular economy practices in the tourism sector with sustainable development (Jacob *et al.,* 2025).

2. Research Methodology

This research adopts a case study approach to explore the communication needs of sustainable tourism in supporting conservation at Sawarna Beach. The selection of a case study approach allows for an in-depth understanding of the dynamics and factors influencing tourism communication in a complex context. These findings are consistent with previous research indicating that qualitative methodologies, including case studies, are highly effective in exploring issues related to tourism and the environment (Scherrer, 2020; Hafizha *et al.,* 2023).

The research process begins with a literature review and the preparation of a proposal, which provides a strong theoretical framework for this study. Next, the researchers collected data through FGDs, interviews, observations, and document studies. In this case, the selection of informants was carried out purposively based on certain criteria, such as cultural understanding and involvement in related activities. This approach ensures that the information obtained is not only valid but also rich in context, supporting the findings of previous studies (Sufiawan *et al.,* 2021; Maudiarti & Adriani, 2021). The informants are the involved and interested parties such as the local village head, tourism managers, accommodation owners, traders, non-governmental organizations (NGOs) concerned with the environment, the local community, and tourists. Below is information about the informants (refer to Table 1).

Table 1. Informant criteria

Informant	Criteria	Quantity
Village Head	Holds an official leadership role; deep cultural understanding; policy-maker	1
Tourism Managers	Directly involved in tourism operations; understand tourism dynamics	1
Accommodation Owners	Provide tourism services; observe tourist behavior and needs	1
Local Traders	Engage with tourists daily; have insight into economic impact	1
Environmental NGOs	Concerned with conservation efforts; active in sustainable development	1
Local Community Members	Residents with cultural and environmental knowledge; involved in tourism	2
Tourists	Experience tourism services; can reflect on communication effectiveness	10

Source: Researcher's calculation (2025)

Data analysis was conducted using the Miles and Huberman approach, which involves data reduction, data presentation, and conclusion drawing. The data reduction process focuses on selecting relevant information, while data presentation is carried out systematically to facilitate further analysis (Creswell & Poth, 2018). This method is recognized in literature as an effective way to capture the complexity of issues related to tourism and conservation.

The validity of the data is ensured through source triangulation, which is the use of various data sources to verify findings. Data from interviews and FGDs were analyzed and categorized, with conclusions agreed upon by the informants through a member check process. This step supports the validity of the research results and ensures the accuracy of the obtained information, in accordance with the principles of participatory research as explained in the studies by Rostini & Rudiyanto (2021). By exploring perspectives from various sources, this research contributes to the development of more effective sustainable tourism practices at Sawarna Beach. This study strengthens the discourse on sustainable tourism communication for conservation, creating a better framework for future initiatives.

3. Research Results

Sawarna Beach, located in Lebak Regency, Banten Province, has emerged as one of the premier tourist destinations with stunning natural beauty. Every year, this beach attracts the attention of thousands of tourists, especially during the holiday season. Data shows that Sawarna Beach during the Christmas 2023 and New Year 2024 (Nataru) holidays, the number of visitors reached 40 to 50 thousand people, reflecting a significant increase in popularity from year to year (Nurabidin, 2024). Its main attraction lies in the beauty of its exotic coastline and its enchanting natural atmosphere, making it an ideal location for those seeking an escape from urban life.

However, behind this attraction, Sawarna Beach faces serious challenges related to environmental issues, particularly waste problems. The increase in the number of tourist visits in recent years has worsened this situation. The local community has expressed deep concern over the negative impact caused by the accumulation of waste, which not only damages the natural beauty but also has the potential to harm the fragile coastal ecosystem. Although the presence of trash is still under control, preventive measures must be taken immediately before the problem becomes more acute.

The presence of trash along the beach not only creates an unsightly view but also affects the lives of marine biota that depend on the coastal ecosystem. Plastic waste, for example, can cause severe damage to marine animals and destroy their habitats. Therefore, it is important to address this issue effectively through an approach that involves all stakeholders.

This research aims to address the issue with an initial approach focusing on identifying the communication needs of sustainable tourism to support coastal ecosystem conservation. The study covers various aspects, including: challenges in maintaining ecosystem conservation at Sawarna Beach, communication needs related to ecosystem conservation in the area, stakeholder participation in sustainable tourism, and the perceptions of tourists and the community towards sustainable tourism and ecosystem conservation.

4. Discussions

4.1. Challenges in Ecosystem Conservation Maintenance at Sawarna Beach

The maintenance of ecosystem conservation at Sawarna Beach faces a series of complex and interrelated challenges, as identified in this study. Various factors, ranging from the role of village governments, BUMDes managers, to community awareness, business actors, NGOs, local media, and academics, all contribute to the existing dynamics of environmental conservation. First of all, the role of the village government in managing waste from visitors is very crucial. Although there are efforts to raise public awareness about the importance of cleanliness, the issue of littering remains significant. Research shows that budgetary support from the central government is crucial for the success of sustainable conservation programs (Saadah *et al.,* 2023; Satria, 2023). Without adequate support, efforts to maintain cleanliness and environmental preservation will become increasingly difficult, as discussed in the study on sustainable tourism destination management (Sya *et al.,* 2021).

Furthermore, BUMDes managers often face limitations in resources and capacity when implementing conservation programs. Although there are innovative ideas, real challenges arise when external support is insufficient. Research shows that better collaboration with the government and local communities is key to enhancing the effectiveness of the program (Sutikno *et al.,* 2023). Solid cooperation can have a positive impact on the environment and society. This is in line with previous analyses regarding the management of BUMDes institutions, which emphasize the importance of synergy among parties (Sutikno *et al.,* 2023).

One of the main obstacles in conservation efforts is the low public awareness of the importance of maintaining cleanliness and environmental sustainability. Many residents are unaware of the impact of daily behaviors, such as littering, on the environment. To address this issue, it is necessary to enhance education and participatory activities involving the community so that they become more caring and active in preserving the environment (Nugraha *et al.,* 2022). Social participation initiatives have proven effective in raising awareness and strengthening community capacity in environmental conservation (Anwar & Shafira, 2020).

Business actors also face challenges in integrating sustainable business practices with local economic needs. Although there is a desire to implement environmentally friendly methods, this often poses a risk to profitability. Research shows that educating customers about the importance of conservation is not easy, as many pay more attention to price than to environmental impact (Supriatna, 2023). Therefore, creative and collaborative efforts are needed to raise public awareness so that sustainable practices can be accepted and support economic and environmental sustainability (Zakiah, 2023a; Jacob *et al.,* 2025).

NGOs also face difficulties in conveying effective information and education to the public. Although various methods have been attempted, the results are often unsatisfactory. The challenge of garnering support for conservation programs also becomes an obstacle, as many parties are more focused on instant gains (Fauziatunnisa *et al.,* 2021). Better collaborative strategies are needed to attract public attention and gain the necessary support in preserving the environment (Dinar *et al.,* 2022).

Local media, on the other hand, face challenges in reaching a wider audience and conveying conservation messages in an engaging manner. Resource limitations often hinder their ability to conduct more intensive campaigns (Sya *et al.,* 2021). Therefore, collaborative support from various parties is needed so that conservation messages can be more easily accepted and implemented by the wider community (Supriatna, 2023).

Lastly, academics often face limitations in applying research findings to real-world practices in the field. Although the research produced is beneficial, challenges arise when implementing it effectively. Closer cooperation with the government and the community is crucial to ensure that the research results can be effectively implemented and provide a positive impact on the environment (Zakiah, 2023a).

Overall, the challenges in maintaining ecosystem conservation at Sawarna Beach indicate that a collaborative approach involving all stakeholders is essential. The proposed solutions in this study include enhancing collaboration between village governments and NGOs, as well as between BUMDes and local communities. Research shows that NGOs can play a crucial role in enhancing community participation in natural resource management (O'Connell *et al.,* 2022). Leveraging NGO networks can help village governments obtain better budgetary support and resources for sustainable conservation programs.

From a practical standpoint, BUMDes managers need to build stronger partnerships with various stakeholders to address resource limitations. Effective collaboration among various actors can strengthen conservation capacity and enhance program success (Kark *et al.,* 2015). Furthermore, to address the low public awareness about the importance of maintaining cleanliness and environmental preservation, there is a need for enhanced education and participatory activities. Research shows that educational programs that directly involve the community can enhance their understanding of the impact of daily behaviors on the environment (Gavin *et al.,* 2018).

Business operators who want to implement sustainable business practices need to be supported with education about the long-term benefits of these practices. Customer awareness about the importance of conservation can be enhanced through creative and collaborative campaigns (Romero-Brito *et al.,* 2016). NGOs can also enhance the effectiveness of conservation programs by developing better communication strategies to reach the community. A more collaborative approach in conveying information can help attract public attention and gain the necessary support for conservation programs (Crosman *et al.,* 2021).

Finally, academics need to be more involved in applying research results to real-world practices by building closer collaborations with the government and the community. Collaboration between academics and other stakeholders can strengthen the positive impact of research and help address environmental issues more effectively (Armitage *et al.,* 2020). Thus, all parties involved in the conservation of the ecosystem at Sawarna Beach need to collaborate to create sustainable and effective solutions, in order to ensure environmental preservation for future generations.

4.2. Communication Needs for Ecosystem Conservation at Sawarna Beach

Based on the FGD results, there are various communication needs among the stakeholders. The Sawarna village government needs better discussion spaces and adequate waste management facilities. Tourism managers want information boards about cleanliness and support from content creators to encourage tourists to be disciplined in maintaining cleanliness, while traders and homestay owners need training and information related to tourism trends and promotions. Tourists themselves expect the addition of trash bins and information about cleanliness. All parties agree that improving facilities and effective communication are crucial for maintaining cleanliness and enhancing the tourist experience at Sawarna Beach.

As stated by the village government and the managers of Sawarna tourism, they need more intensive discussion space. This aligns with research findings stating that effective communication between various parties is crucial for strengthening collaboration (Asmah, 2023). Regular meetings and discussion forums can serve as platforms for stakeholders to share information, solve problems together, and develop comprehensive strategies for conservation.

The discussion space is expected to foster a commitment to a clear division of tasks and responsibilities among stakeholders, which is crucial to prevent overlapping roles and ensure efficient management. Furthermore, well-defined roles help improve coordination in the field, which in turn will contribute to achieving conservation goals (Rahayu, 2023). For example, the government can act as a regulator, while NGOs can focus on educating and training the community. Musleh *et al.* (2023) explain that dialogue among stakeholders provides an opportunity for various parties to contribute with their expertise and resources (Moya *et al.,* 2023).

The main need from the perspective of traders is to obtain data on tourists' preferences in choosing souvenirs, so that the products we offer can meet their expectations. Meanwhile, from the perspective of homestay owners, they need training on the standardization of quality homestays to attract both domestic and international visitors. In addition, strengthening promotion is still necessary. It would be better if there were more communication media informing about the cleanliness of each homestay, facilitated by the government through cooperation with business operators.

One crucial initial step is the development and promotion of ecotourism certification programs. Certification not only recognizes environmentally friendly practices but also serves as a guide for tourists in choosing sustainable destinations (Dania, 2023). Chen & Cheng (2023) show that engaging content on social media is necessary to attract tourists (Amalia & Hanika, 2021; Fitriyah & Nurhaeni, 2021; Moslehifar *et al.,* 2016), and furthermore, social media can enhance awareness and encourage tourist participation in sustainable activities (Chen & Cheng, 2023).

This research also highlights the urgency of using digital and outdoor media to educate tourists. This aligns with the research by Emrizal & Primadona (2020), which emphasizes the importance of valuing local values, including environmental sustainability, and communicating them thru appropriate media, such as social media, posters, and direct campaigns, which are crucial for reaching a wider audience and creating interactive engagement (Emrizal & Primadona, 2020), such interactive elements are known to be effective in increasing tourist engagement by enhancing situational awareness (Yang, 2025). Gulati's (2021) research highlights the importance of using social media to promote sustainable behavior and strengthen conservation movements more broadly and quickly at tourist destinations (Gulati, 2022). Font *et al.* (2019) stated that digital information platforms can also serve as a primary source of information for visitors and local communities regarding ongoing conservation initiatives. Meanwhile, Tanti *et al.* (2024) emphasize the importance of effective communication involving cultural sensitivity, collaboration, and technological adaptation. Additionally, stakeholder involvement, including government and NGOs, is crucial in the development communication process, including in the context of tourism.

4.3. Perception of Tourists and the Community towards Sustainable Tourism and Ecosystem Conservation

Overall, the perceptions of tourists and the community indicate an increased awareness of the importance of sustainable tourism and ecosystem conservation, as well as hopes for better management. Sustainable tourism has become an important issue for the local community, with diverse views on the benefits and challenges involved. Many members of the Sawarna Village community see sustainable tourism as an opportunity to gain economic benefits through jobs, businesses, and local investments. They hope to see an increase in income and economic opportunities generated by the tourism industry (Zakiah, 2023b). In addition, the community also feels that sustainable tourism helps preserve local culture and the environment. Efforts to respect and preserve traditions as well as reduce negative impacts on the environment are considered important in maintaining cultural and environmental sustainability (Dewi, 2021; Kurniasari, 2021).

However, there are challenges faced by the community regarding sustainable tourism. Some of the issues that often arise include waste management, high tourists' density, and the potential changes in traditional ways of life. Conflicts between economic needs and the preservation of culture or the environment can also arise in the context of sustainable tourism. To address this challenge, cooperation between local governments, the private sector, and local communities is considered important (Munandar *et al.,* 2022). For this reason, a joint commitment from various parties is necessary to achieve sustainable tourism that benefits all involved, including local communities, tourists, and the environment.

From the perspective of tourists, they are increasingly aware of the importance of environmentally friendly and responsible practices in sustainable tourism. They tend to choose destinations that implement environmentally friendly practices and support conservation initiatives (Ginting *et al.,* 2020; Kurniasari, 2023). Additionally, tourists also seek authentic and sustainable experiences, including interactions with local communities and activities that promote environmental conservation (Rachmiatie *et al.,* 2020).

Although many tourists support the principles of sustainable tourism, they also face obstacles such as a lack of information, limited destination choices, or additional costs for sustainable options (Arcana *et al.,* 2021). Therefore, it is important to raise awareness and improve the accessibility of information related to sustainable tourism so that tourists can make more sustainable choices.

In developing sustainable tourism destinations, the integration of local wisdom and culture becomes an important factor. The potential of cultural and natural tourism that a region possesses can be a strong attraction for tourists (Masesa, 2023; Rukmana & Purnomo, 2023). In addition, the development of sustainable tourism also requires the active role of the local community, such as through tourism awareness groups or organizations driving the tourism sector (Choirunnisa & Karmilah, 2022; Widagdo & Mulia, 2022).

Increasing public understanding and participation in the conservation of the Sawarna Beach ecosystem is very important to promote sustainable tourism practices. One effective strategy is through educational campaigns that include workshops, seminars, and other educational activities. Mahiddin (2023) emphasizes that environmental education plays a crucial role in educating tourists and empowering communities, which in turn can raise awareness about environmental issues in the context of sustainable tourism. The development of engaging educational materials, such as brochures and guides, is also a crucial step in expanding the community's knowledge about sustainable practices (Farsari, 2022).

This research also reveals the urgency of using social media as a means of promoting and educating about sustainable tourism and ecosystem conservation. Educational materials can be presented in the form of brochures, videos, and posters on social media, which have proven effective in disseminating information and raising environmental awareness among tourists and the community (Dewi & Roziqin, 2022). Collaboration with the media is also important to expand the reach of conservation messages (Kerber & Kramm, 2021). Moreover, community involvement in educational campaigns and active participation in waste management can foster a sense of ownership towards conservation initiatives, thereby enhancing the success of these programs (Nuryadin *et al.,* 2021; Tarigan *et al.,* 2023).

4.4. Stakeholder Participation in Sustainable Tourism at Sawarna Beach

Increasing the participation of tourists and local communities in conservation efforts requires an approach that directly involves them. Based on the information obtained from the FGD, it shows that all elements of stakeholders are involved in maintaining cleanliness, both in the homestay environment and in the Sawarna beach area. The vendors consistently urge visitors to maintain cleanliness and clean up the trash in their selling areas. Additionally, community members and environmental NGOs also frequently directly encourage tourists to keep the area clean.

Meanwhile, the homestay owners are also very disciplined in maintaining cleanliness in their respective areas, due to the awareness that visitors will be attracted to clean and friendly homestays. This is confirmed by visitors' statements that traders often inform them about waste disposal locations. However, visitors expect trash bins to be evenly distributed in the Sawarna beach area.

This participatory approach involves two-way communication, where feedback from tourists and the community is used to improve and adjust conservation strategies. This research shows that listening to and responding to feedback from local communities and tourists can strengthen relationships and enhance the effectiveness of conservation programs. This also creates a greater sense of community for conservation initiatives.

Active participation programs, such as beach clean-up activities and conservation training, have been proven to enhance a sense of ownership and responsibility towards the ecosystem. This involvement encourages proactive actions that support environmental preservation. The development of strategies to increase participation also involves ongoing education and motivation through incentives or rewards, such as the provision of certificates or awards for individuals or groups actively engaged in conservation activities. This research underscores that strategies combining education, engagement, and incentives can result in higher and more sustainable participation.

Increasing public understanding and participation in the conservation of the Sawarna Beach ecosystem is key to promoting sustainable tourism practices. One effective strategy is through educational campaigns that include workshops, seminars, and educational activities. Research by Mahiddin (2023) emphasizes the importance of environmental education in empowering communities, which can be applied in the context of sustainable tourism to raise awareness of environmental issues (Mahiddin *et al.,* 2023).

Involvement of the local community, including community leaders and organizations, is a crucial element in the planning and implementation of conservation activities. Research by Jumiati (2024) underscores the importance of local leaders in bridging community needs and conservation goals, thereby creating effective synergy in preservation efforts. Participatory programs are also very important in building community engagement (Jumiati *et al.,* 2024). Research by Gorpe & Öksüz (2022) shows that activities such as beach clean-ups not only increase participation but also strengthen the community's sense of ownership towards the environment (Görpe & Öksüz, 2022; Kusmendar *et al.,* 2023). These activities can encourage the community to directly engage in ecosystem preservation, thereby increasing awareness and commitment to sustainability.

The development of engaging educational materials, such as brochures and guides, can also enhance public understanding. Farsari's research (2021) indicates that informative educational materials can help disseminate knowledge about sustainable practices, making them an effective tool in raising awareness (Farsari, 2022). Finally, it is important to implement a transparent monitoring and reporting system. According to research by Bhutio *et al.* (2022), open reporting of activity results not only increases accountability but also allows for better strategy adjustments in the future (Bhutio *et al.,* 2022). By integrating these various approaches, sustainable tourism communication efforts at Sawarna Beach can be more effective, support ecosystem conservation, and enhance community participation in environmental stewardship.

Communication and education efforts related to waste management at Sawarna Beach are very important to support the conservation of the local ecosystem. One of the initial steps is to conduct an awareness campaign that highlights the negative impact of tourism on the environment. Research by Aziz & Jefri (2020) shows that effective campaigns can enhance tourists' understanding of the importance of responsible waste management, thereby encouraging them to adopt better disposal practices. Training for tour managers and hotel staff is also very crucial (Aziz & Muharani Jefri, 2020). Research by Xu *et al.* (2023) emphasizes that education on environmentally friendly practices can improve waste management efficiency in the tourism sector (Xu *et al.,* 2023). With training, they can implement more sustainable practices in their daily operations.

Educational materials such as brochures, videos, and posters are effective tools for disseminating information. Research by Dewi & Roziqin (2022) underscores the importance of these materials in raising environmental awareness among tourists and the community (Dewi & Roziqin, 2022). In addition, collaboration with the media can expand the reach of conservation messages (Kerber & Kramm, 2021). Community involvement in educational campaigns is also key. Research by Nuryadin *et al.* (2021) notes that community participation can foster a sense of ownership towards waste management initiatives, thereby enhancing the success of the program (Nuryadin *et al.,* 2021). Additionally, workshops and seminars discussing effective waste management techniques, as revealed by Tarigan (2023), can serve as important means to educate the community (Tarigan *et al.,* 2023).

The distribution of trash bins in strategic locations will facilitate proper waste disposal. Research by Lumeno *et al.* (2022) notes that the accessibility of trash bins can encourage more responsible waste disposal behavior (Lumeno *et al.,* 2022). Promoting the 3R principles (Reduce, Reuse, Recycle) to tourists and the local community is also important (Obersteiner *et al.,* 2021). Lastly, education in schools that includes material on waste management and conservation can foster environmental awareness from an early age. With all these efforts, Sawarna Beach can achieve better waste management, support the conservation of its ecosystem, and contribute to the sustainability of tourism.

This research has important implications for the development of sustainable tourism strategies, especially in the context of ecosystem conservation in tourist areas such as Sawarna Beach. The participatory approach involving local communities and tourists is not only effective in raising environmental awareness but also significantly contributes to long-term preservation. The success of the conservation programs identified in this study shows that close collaboration between local stakeholders, including community leaders, organizations, and tourism industry players, is key to creating sustainable conservation initiatives with real impact.

Based on the findings of this research, it is recommended that conservation programs in Sawarna Beach and other tourist areas continue to integrate environmental education into all aspects of tourism activities. This includes regular training for tour operators and homestay managers, as well as awareness campaigns involving the wider community. In addition, the government and non-governmental organizations should continue to develop and expand incentives for active participation in conservation activities, such as awards and certifications, to enhance community motivation and commitment. Lastly, the implementation of a more transparent monitoring and reporting system, as well as involving the community in the evaluation process, will be very useful for assessing the effectiveness of existing programs and making the necessary adjustments for future improvements.

Conclusions and Further Research

The conclusion of this research emphasizes the importance of collaboration among various stakeholders at Sawarna Beach to support sustainable tourism and ecosystem conservation. The findings indicate that the synergy between village governments, BUMDes managers, business actors, NGOs, the Lebak Regency government, the media, and academics plays a crucial role in cleanliness management and environmental promotion. Effective coordination and a deep understanding of each stakeholder's role can avoid overlapping responsibilities and improve management efficiency. The results of the Focus Group Discussion (FGD) revealed that each stakeholder has specific communication needs: the village government requires discussion spaces and better waste management facilities, tourism managers need information boards and support from content creators, while traders and homestay owners need better training and promotion. Tourists expect the addition of trash bins and information on cleanliness to support compliance with environmental regulations. Effective communication through social media and educational materials has proven to be key in enhancing participation and environmental management. Research also shows that cleanliness and waste management are major concerns for tourists, who expect better conservation efforts and positive interactions with the local community. Suggestions include the need for managers to clarify conservation efforts and utilize social media for education, which aligns with strategies for educational campaigns and community engagement in environmental conservation. Further research could focus on exploring the role of information and communication technology (ICT) in raising environmental awareness and promoting sustainable tourism practices. Additionally, research could also evaluate the long-term impact of implemented conservation programs and identify factors influencing their success.

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Credit Authorship Contribution Statement

Enjang Pera Irawan: Conceptualization, Methodology, Supervision, Writing - review and editing
Andi Pajolloi Bate: Investigation, Data curation, Formal analysis, Writing - original draft
Imam Rismahayadin: Validation, Visualization, Writing - review

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that in the writing of this article, they have utilized generative AI technology and AI-assisted tools to enhance the language structure and clarity. The use of AI was aimed at improving the quality of writing and language clarity, without altering the substance and research findings presented. They take full responsibility for the accuracy and authenticity of the data, results, and conclusions presented in this article, and they have conducted thorough verification and validation of all information presented. We affirm that the use of AI in the writing of this article has been done transparently and in accordance with the ethics of scholarly writing.

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An Analysis into India's and China's Revealed Comparative Advantage on Travel and Tourism Economic and Environmental Impact

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Abstract: Travel and Tourism is a major economic sector globally, and countries invest significantly to leverage their natural, cultural, and infrastructural assets. It has come to stay as the largest service industry and widely used as an instrument of growth of national income, poverty alleviation, infrastructure development and employment generation. The Asia Pacific region is slated to be the most preferred tourism regions of world; whereas India, and China, by their size both in terms of geography and population are the rising nations on the global tourism front. As per the different World Travel and Tourism Council reports, these two countries are projected to upsurge in their respective tourism economies both in terms of contribution to GDP and employment in the post pandemic world. However, the growing Economic Impact of tourism also increases the threat of rising Greenhouse Gas (GHG) Emissions impact. The Travel and Tourism Economic and Greenhouse Gas (GHG) Emissions impact cannot be studied in isolation but has to be analyzed for overall advantages for an economy, more so for the massive economies of India and China.

This is comprehensive comparative study on the background of bi-decadal economic impact analysis (1995–2015), covering the period prior to the Covid-19 pandemic in India and China leading to study of economic and Greenhouse Gas (GHG) Emissions impact in the pandemic and post pandemic period through the Revealed Comparative Advantage (RCA) Analysis. It aims to assess the potential of tourism as a key driver of sustained and enhanced economic growth as well as focus on control environmental impact in India and China in the coming decades.

Keywords: India and China; Economic Impact; tourism GDP; tourism employment; environmental impact; Greenhouse Gas (GHG) emissions.

JEL Classification: L83; Z32.

Introduction

India has long historical connection to global trade, particularly through the Spice Route, established its early role in international exchange, creating a long-standing cultural foundation for tourism. India has seen significant growth since 2000s after India's economic liberalization policies of 1990s, with its tourism sector's GDP projected to grow substantially in the coming years. Recent efforts include promoting cultural, religious and medical tourism and a focus on sustainability to attract a broader range of travellers. China's tourism sector on the other hand began to develop significantly after its economic reforms in the late 1970s, leading to a dramatic increase in tourism income. The sector has been propelled by strong economic performance, sophisticated infrastructure development with advance supply chain, and an improving business environment, making it a significant global tourism powerhouse. However, the Travel and Tourism's environmental impact historically taken the backseat in both the countries. Pre-pandemic, China's tourism carbon footprint was the world's largest in absolute terms; India's footprint and contribution to global growth rose quickly from a lower base. Both countries are now scaling sustainability programs, but aviation/transport energy and accommodation utilities remain the biggest levers.

India and China are amongst the top 10 largest global travel economies in 2024–25 in terms of Economic contributions. China is world's second largest Tourism economy contributing 1,300 US$ billion, whereas India is the world's eighth largest Tourism economy contributing 231.6 US$ billion, moving up from the 10th position, India is forecasted by the WTTC to attain the fourth position within the next decade, indicating significant progress in the tourism sector (The Indian Express, 2025).

The total and direct contributions of travel and tourism to GDP, along with the sector's role in employment generation, have been extensively studied globally. According to the World Travel and Tourism Council (WTTC, 2024), the total contribution of travel and tourism to global GDP was estimated at USD 10.9 trillion, representing 10 percent of the global economy. The sector was also estimated to support 357 million jobs worldwide, accounting for nearly one in every ten jobs. Total sectoral contributions were estimated at over USD 1.3 trillion for China, positioning it among the world's largest tourism economies, while India's contributions were assessed at more than USD 230 billion. Both nations demonstrated rapid recovery post-COVID-19, with India's growth largely driven by domestic tourism demand, and China benefiting from extensive infrastructure and international visitor receipts (WTTC, 2023).

China with its world ranking of 2 in terms of Travel and Tourism's Direct Contribution to GDP (139.5 US$bn in 2022) and India (68.5 US$bn in 2022) at 10th rank, both exceeding the world average (12.9 US$bn in 2022). With respect to the direct contribution of travel and tourism to employment, China, generating 23,166.4 thousand jobs in 2022, ranked first globally, while India, with 16,897.8 thousand jobs in the same year, held the second rank position – both the countries above than the world average (1,156.0 thousand jobs in 2022). In terms of visitor exports (contribution to exports) India (2.8% Share in 2022) is at World rank 131 and China is (0.8% Share in 2022) at world rank 168 (Travel & Tourism Economic Impact: India, 2023). In terms of Travel and Tourism's Contribution to GDP, China is way ahead than India. However, as per the Travel and Tourism Competitiveness Report (2015), by the World Economic Forum, India is ranked 12th in the Asia Pacific region and 52nd overall on the list of the world's attractive destinations (China ranks 6th regionally and 17th globally; whereas Malaysia follows at ranks 7th regionally and 25th globally). India's natural resources ranked at 17th are vast and diverse and its cultural resources with a global ranking of 10th include world heritage sites, both natural and cultural.

The Bloom Consulting (2024) Country Brand Ranking (Tourism Edition, 2024–25), partnering the World Economic Forum, European and Asian countries are noted as major tourism economies, with India ranked 17th after a five-place rise and China, including Hong Kong SAR, ranked 24th following a sixteen-place decline – both countries being in the top 25.

While China boasts strong infrastructure, India's strength lies in its sustained appeal for its diverse culture, and natural heritage, medical and spiritual tourism. The paper uses data from global tourism reports and comparative indices (mainly from WTTC Data) to build the RCA analytics to show India's ability to enhance its competitive positioning in the future based on the pre pandemic bi-decadal historical analysis coupled with post pandemic study of both the Economic and Environmental Impacts.

1. Research Background

Tourism is a service sector industry which has a vast potential to contribute to visitor export, GDP and employment in the economy as well as its multiplier effects in generating induced income and employment. The Asia Pacific region is slated for high tourism growth, however the region has to usher in the service sector mindset, infrastructure supply chain and right skills for the people connected with the sector. There is growing global awareness around the shift toward ecotourism and sustainable tourism, emphasizing the need to use present resources responsibly to ensure they do not compromise the needs and resources of future generations hence the urgent need for immediate measures of environmental control particularly for the larger economies of China and India who are also one of the largest contributors to Greenhouse Gas (GHG) Emissions. Newer aspects in travel and tourism sector should be identified and motivating bigger industries to target on to this sector as the tourism world over is the only sector, which if developed in a planned way, it can accommodate the need of tourists, environment as well the society (Dangarwala and Rao, 2016) and simultaneously has the capacity to create and sustain employment and entrepreneurship growth.

Bhatia (2016) in his book "International Tourism Management" approaches the subject of tourism from the perspectives of a social science; discussing the subject from historical, economic organizational and international perspectives. He emphasizes that tourism should be recognized as a major source of employment, as it is a highly labor-intensive industry that provides opportunities for both semi-skilled and unskilled workers. It has created employment opportunities for the local population, and it is a major source of income and employment for individuals in many places.

The region, particularly India and China, are blessed with great geographical location which has made it a historical and cultural hub for the tourism. However, tourism in the region continues to suffer from inadequate infrastructure and a shortage of adequately trained manpower as well as the service mindset for tourism. Malaysia can be one example that has improved mindset for tourism. This aspect of need for government initiative has been well realized by the Malaysian Tourism. The Chairman of Tourism Malaysia, Dato' Dr. SiewKa Wei (Malaysia Media, 2017) attribute the growth trend to several service sector factors, particularly the improvements made to visa services following the Prime Minister Datuk Seri NajibTunRazak's announcement to facilitate the matter. He stresses the fact that the Malaysia's easing the travel formalities for Chinese and Indian tourists travelling to Malaysia have helped to improve the tourists' arrivals for these two markets. He said that the constant review of the visa policy is in the interest of Malaysian tourism industry and the efforts and cooperation to improve visa services have now made it easier for Chinese and Indian tourists, the two biggest tourist generating countries, travel to Malaysia. The Malaysian tourism is trying to tap the year-round tourist markets with big populations such as China and India, and the high-income Middle Eastern market and synergising its promotional efforts towards that end. Malaysia is expanding the tourism growth for its second and third tier cities enabling it to expand to new target markets (Bahari, 2016).

The Indian travel and tourism professionals, who are shaping the Indian tourism growth at the ground level, also share the same pragmatism. The current research has been always pivotal of putting forth the views and arguments in an academic discussions environment. Any research that concerns an industry, and which does not include the views and arguments of the practicing professionals of the industry or sector is only half-baked discussion. All the researches and discussions that does not lead to value addition to the sector or industry concerning can be academic but is only contributing to nothing to the development of tourism. Sharat Dhall, the COO (B2C) of an online travel agency, 'Yatra.com', maintains that although the Indian tourism industry is growing at a rapid pace, India still has a long way to go in terms of fulfilling its potential as a tourism destination in contrast with developed tourism destination nations. The Chinese tourism industry & OTAs have benefited from country's economic development and in the same terms, India's tourism sector and online travel market is poised for continued growth and value creation as the economy grows, following the well-established path seen in the US and China (Mandal, 2017). Similarly Ritesh Agarwal, Founder & CEO of 'OYO Rooms' has emphasized upon the need of Infrastructure development which is a pre-requisite to provide the much-needed impetus for the industry's growth. Some additional incentives should be provided to the investors for infrastructure investments in the travel and tourism sector to promote growth. He also calls for supporting small owner-friendly policies including the exemption of taxes in the sub-Rs. 1000 hotel room category (Mandal, 2017). Gautam Kaul, COO of the Inbound Division at Yatra Exotic Routes (a division of Yatra.com), concurs that infrastructure and transportation are indeed major challenges (Arlene, 2013). These professionals admit that the Indian travellers' mindset has evolved significantly over the recent years that now see travel as a mode of self-realisation, exploration and experiencing different forms of lifestyles. Leisure travel is no longer considered a luxury but rather a necessity to rejuvenate oneself.

The Travel and tourism realize that the growth driver for China, India and others in the Asian region will rely on their investment in people. If China and India want to meet their targeted goals, they must invest in their people, be it by the Chinese Five-year plans, India's National Institute for Transforming India (NITI Aayog) (Sheng, 2015). A common challenge faced by India and China is that rural migrants moving to urban areas often lack the knowledge and skills in innovation and entrepreneurship required by tourism Sector as one of high-end service sectors. The need for trained and skilled human resources is one of the most pressing issues faced by India at present (Aman Mohammed Khan, 2014).

The gaps between tourism planning and implementation - particularly in areas such as infrastructure development, tourism promotion, and actual tourist arrivals - need to be identified and effectively addressed. An analysis should be conducted to assess the effectiveness of marketing strategies in driving the growth of the tourism industry, along with the role of financial management in supporting this growth. It is also important to examine how tourism projections impact key stakeholders - such as government bodies, non-governmental organizations, commercial enterprises, local communities, and lobby groups - and how these stakeholders, in turn, influence tourism outcomes. Moreover, formulating an effective tourism policy is essential to ensure that the benefits of tourism contribute meaningfully and exclusively to the prosperity of local economies. (Sarang, 2014).

Huibin, Marzuki, Rofe and Razak (2012) have studied and analysed the successful experiences in India, Australia and Macau and further suggested a model for the successful growth of tourism industry of China. He has stated that China has a untapped potential to grow as far as Tourism industry is concerned and therefore china has to take some great measures at all level of administrations to improve the present conditions. A proposed model is suggested to increase more value-added features to further intensify international tourism development in China.

Tourism growth in any economy has another alarming effect on the environment. Tourism growth has a dual impact; while contributing to income it also exerts pressure on the environment. Globally, tourism accounts for approximately 8–9% of greenhouse gas emissions, primarily from transport and accommodation (Lenzen *et al.* 2018; Sun *et al.* 2024). Studies identify China and India among the top contributors to tourism-related emissions growth in the post pandemic world, due to their expanding middle class domestic tourism and increasing mobility (Down To Earth, 2024). China has developed more systematic approaches to measuring and mitigating emissions from tourism. Liu and Yang (2024) estimate significant regional variations in tourism-related carbon footprints across provinces, with high emissions concentrated in urbanized regions. Policy innovations such as sustainable aviation fuel trials, eco-labels for hotels, and provincial carbon-neutral tourism zones reflect China's alignment with its national carbon neutrality target for 2060 (Zhang, 2024).

In India, while the literature is relatively nascent, tourism emissions are rising rapidly, largely from road and air travel. Studies suggest that unless integrated with renewable energy and sustainable mobility initiatives, India's tourism growth could undermine its climate commitments (Sun *et al.* 2024). Empirical research also finds that India's domestic-led tourism has a lower carbon intensity per capita than China's internationalized model but faces challenges in balancing affordability, infrastructure, and sustainability.

The studies suggest that while both India and China have leveraged tourism for economic growth and employment, their environmental trajectories diverge. China's greater focus on infrastructural investment and carbon management contrasts with India's domestic-market-driven growth and slower environmental mainstreaming. A comparative approach reveals that the challenge for both nations lies in achieving a balance between tourism-driven economic benefits and environmental sustainability, which will be critical to shaping their future comparative advantage in the sector.

2. Research Methodology

The study relies on the secondary data of Tourism Visitor Exports, contribution to GDP and Employment vis-a-vis the share of each of these three component in the respective countries over the bi-decadal growth in the pre pandemic era and five year pandemic and post pandemic period in the GDP, Employment and Greenhouse Gas (GHG) Emissions with the objective to establish the quantitative analysis towards forecasting the long term growth paths as well as to establish impediments to such the growth in India and China.

The study uses the Revealed Comparative Advantage (RCA) as the research tool to study comparative analysis of the two countries and particularly.

The computation of Revealed Comparative Advantage (RCA) Index is as under:

RCA =(Xih/Xit)/(Xwh/Xwt),

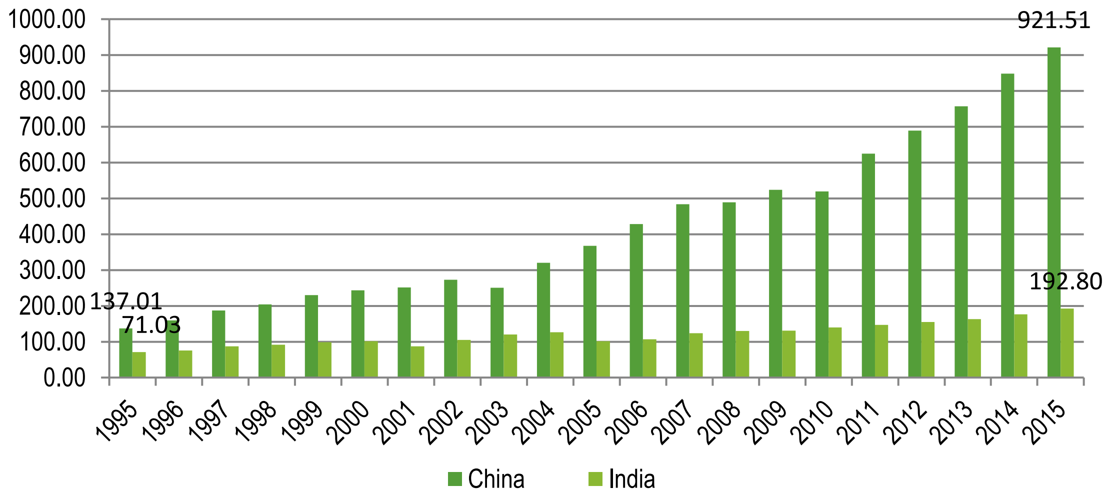
Xih= Country i's Travel and Tourism contribution to GDP/ Employment / GHG Emissions in year h
Xit=total Travel and Tourism contribution to GDP/ Employment / GHG Emissions of country i over study period t
Xwh=World Travel and Tourism contribution to GDP/ Employment / GHG Emissions in year h
Xwt=total World Travel and Tourism contribution to GDP/ Employment / GHG Emissions over study period t.

2.1 An Analysis on Travel and Tourism Income and Employment Generation

India aims to promote tourism as a key driver of economic growth, leveraging its direct and multiplier effects to generate employment and serve as an effective tool for poverty alleviation. The study focussing on the two countries are analysed for contributions to the Income and Employment generation in the respective economies and accordingly, the study employs statistical tool of Revealed Comparative Advantage (RCA) to arrive at the outcomes.

In terms of volume China's income from Travel & Tourism far greater exceeds than that of India in the pre pandemic bi decadal era although starting with comparable volume in the mid 1990s (Figure 1).

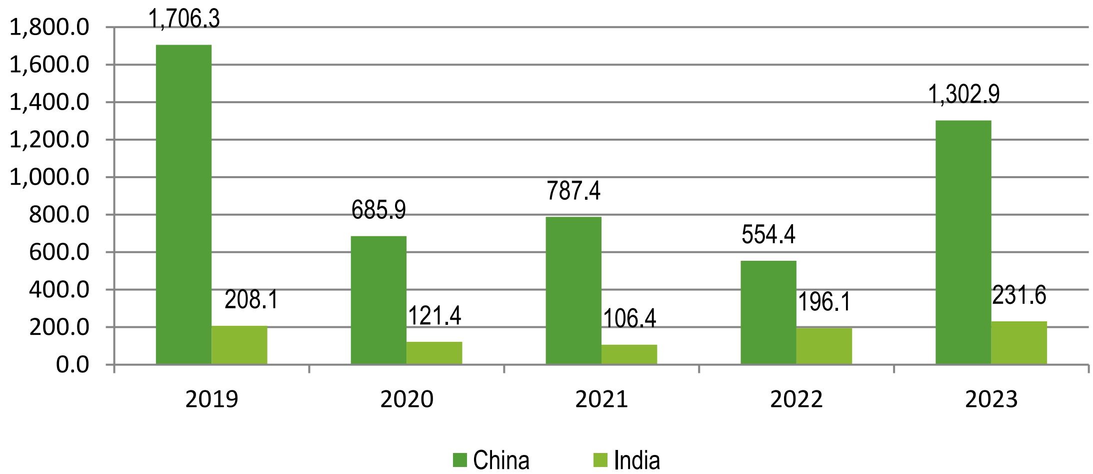
Figure1. Travel & Tourism Total contribution to GDP (US$ in bn: Real prices)



Source: Based on WTTC Data Gateway Economic Research. https://tool.wttc.org/

However, both countries saw in the decline of volume of income in the pandemic era but were able to regain back to 2019 position with India regaining completely and China regaining was slow possible because of extended lockdown of the economy.

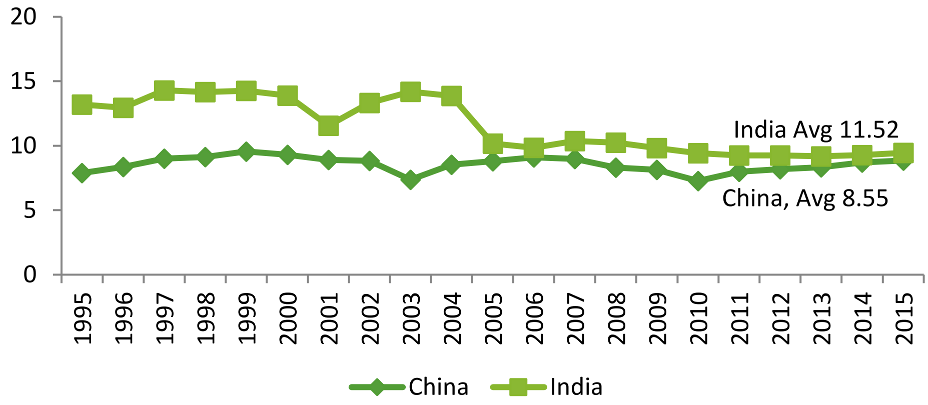
Figure 2. Travel & Tourism Total contribution to GDP (US$ in bn: 2022 prices)



Source: Based on WTTC WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

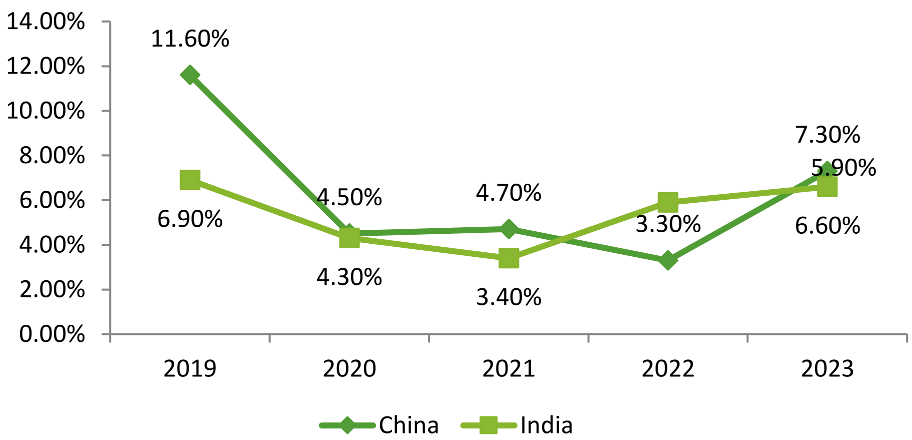
If the comparison is to be made between the Travel and Tourism's Share of Contribution to GDP (% of GDP) in their respective economies along with the Share of Contribution to Employment (% of total employment), the trends show completely opposite picture to that of the pre pandemic and during our post pandemic period. China shows steady progress in improving the Travel and Tourism percentage share in its respective National GDP whereas India shows the steady decline in the bi decadal period despite India having higher average percentage share than China (Figure 3) – the same is reversed in the 2019-2023 period with China improving and India declining drastically (Figure 4).

Figure 3. T&T percentage share of contribution to National GDP



Source: Based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

Figure 4. T&T percentage share of contribution to National GDP



Source: Based on WTTC WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

Similarly, if we take the volume of Travel and Tourism total contribution to the employment, we come across almost similar trends in the bi decadal pre pandemic period whereby China is gaining steadily and India losing rapidly (Figure 5). This is evident in Travel and Tourism percentage share of employment in the respective economies as shown in Figure 6.

Figure 5. T&T Total contribution to Employment (Thousands of Jobs)

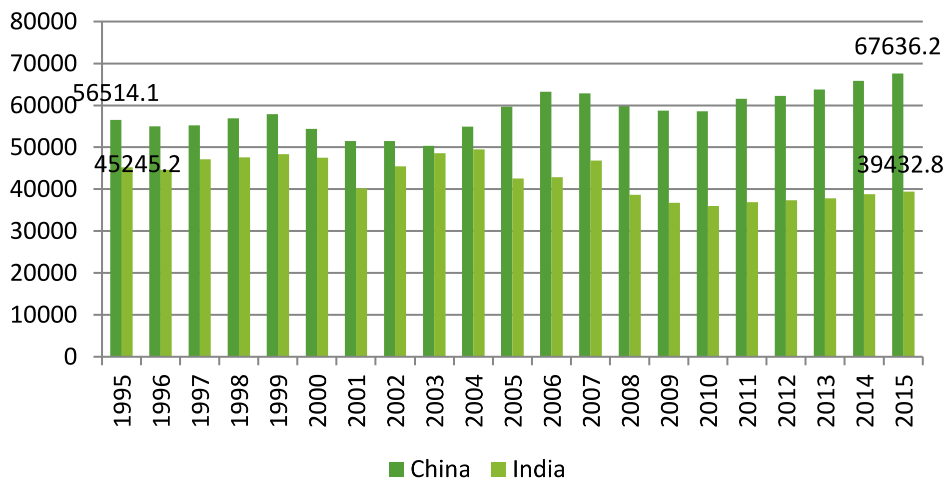
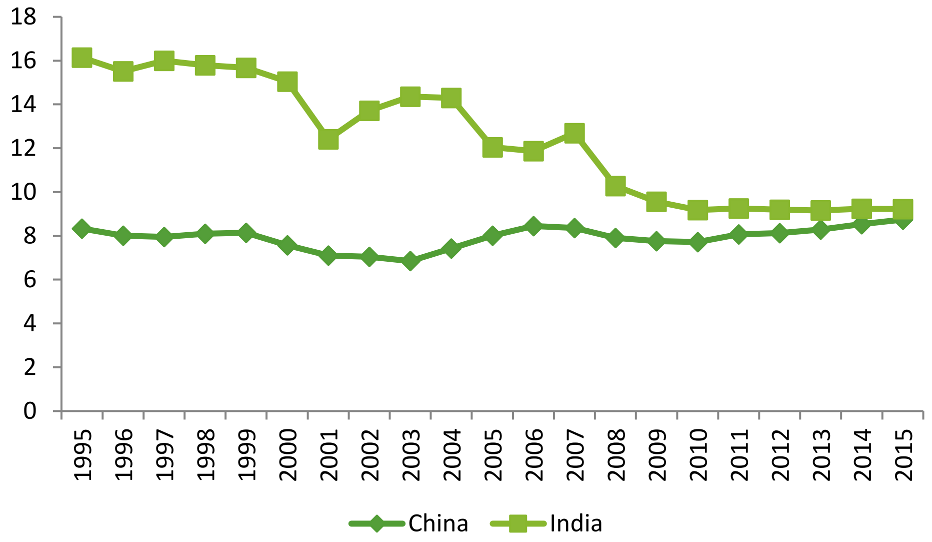


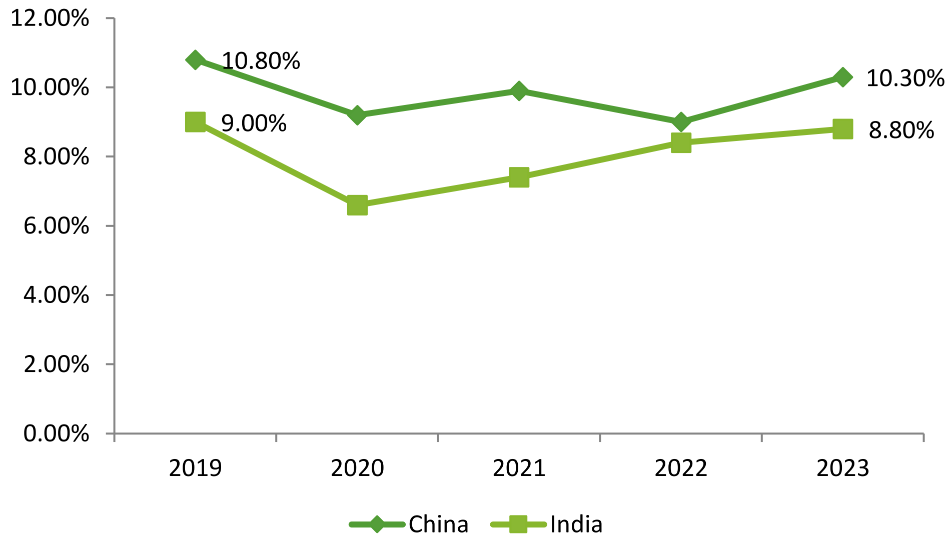
Figure 6. T&T percentage share of total employment



Source: Based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

However, post 2019 the Travel and Tourism total employment as well as the percentage share of employment in both India and China has shown remarkable recovery in almost rebounding back to 2019 level in the post pandemic period in their respective economies.

Figure 7. T&T percentage share of total employment



Source: Based on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

2.2 An Analysis on Travel and Tourism Greehouse Gas (GHG) Emission

The economic impact of Travel Tourism remains incomplete the environmental impact is not studied for the sector to make progress towards sustainable growth. China and India are accounting for the largest Greenhouse Gas Emissions and only United States of America is leading ahead of them (Down To Earth, 2024). The WTTC (2024) Travel & Tourism's Global Footprint on the Environmental footprint shows that the Global Absolute Travel & Tourism greenhouse gas (GHG) emissions have been 3410 million tonnes of CO_2 equivalent in 2023 and that the Sector's share of total greenhouse gas emissions in 2023 stood at 6.55%. Talking individually about China and India, Absolute Travel & Tourism greenhouse gas (GHG) emissions has been respectively 583 and 247 million tonnes of CO_2 equivalent in the same year and their sector's share of National GHG Emissions stood at 3.49% and 4.83% respectively for China and India.

China and India share of Absolute Travel & Tourism greenhouse gas (GHG) emissions and their respective share of National GHG Emissions are respectively shown in figures 8 & 9 below. Both countries are able to bring down the Travel and Tourism share of GHG emissions out of total nation GHG emissions considerably down from 2019 level to 2023 level. However, if we compare the Travel and Tourism share of GHG emissions out of the respective national emissions from 2010 level to 2019 level, we find that the same has increased in case of China and India has been able to decrease the emissions considerably. If we follow the 2010 level to 2019 level, then China needs to take all the more effective steps and India must follow the suit as the current trend shows that both the countries since 2022 onwards are moving upwards in their respective Travel and Tourism share of National GHG Emissions.

Figure 8. Absolute Travel & Tourism Greenhouse Gas (GHG) Emissions (Million tonnes of CO_2 equivalent)

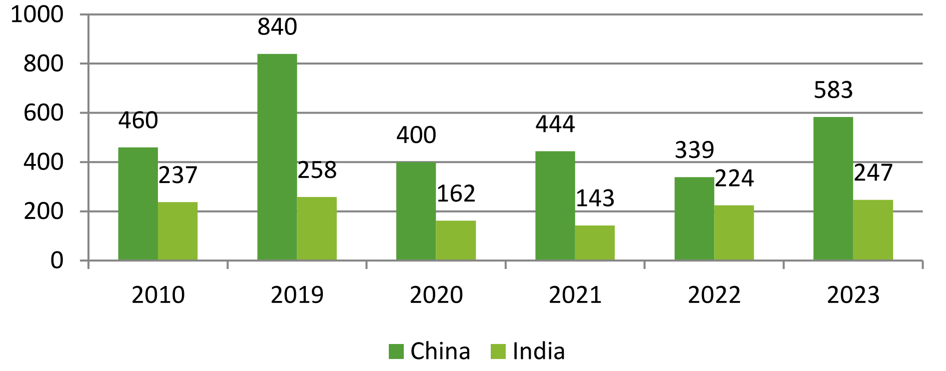
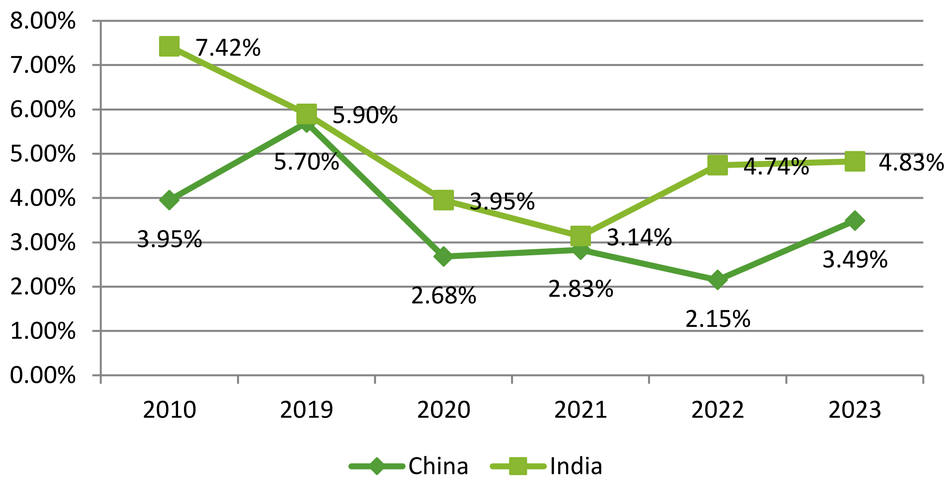


Figure 9. Travel & Tourism Share of National GHG Emissions



Source: Based on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

2.3 Revealed Comparative Advantage Analysis

India and China being the larger economies in the Asia Pacific region, the region slated for immense tourism growth possibilities, as the instrument for growth and employment. The economic impact of tourism is still to be further realized for both the countries, particularly for sector's capacity to generate employment for the World's most populous countries. However, the increases in tourism's economic impact give rise to environmental negative impact which must be part of the new studies as this one. The economic impact in terms of revealed comparative advantage must be studied together with the revealed comparative advantages for environmental impact related to Greenhouse Gas (GHG) emissions.

India's tourism growth in income and employment capacity along with environmental impact needs to be deeply probed with China to understand and plan for the Indian tourism capacity in the more sustainable sense. The study uses the Revealed Comparative Advantage (RCA) as the research tool to study comparative analysis of the two countries and particularly with reference to India.

A. RCA of Travel & Tourism's Total contribution to GDP (Bi Decadal Pre Pandemic)

Considering the WTTC Economic Impact data on Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) as presented in the previous section for the two countries respectively needs to be analysed in relation to the World's Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) and the revealed comparative advantage follows as below Table

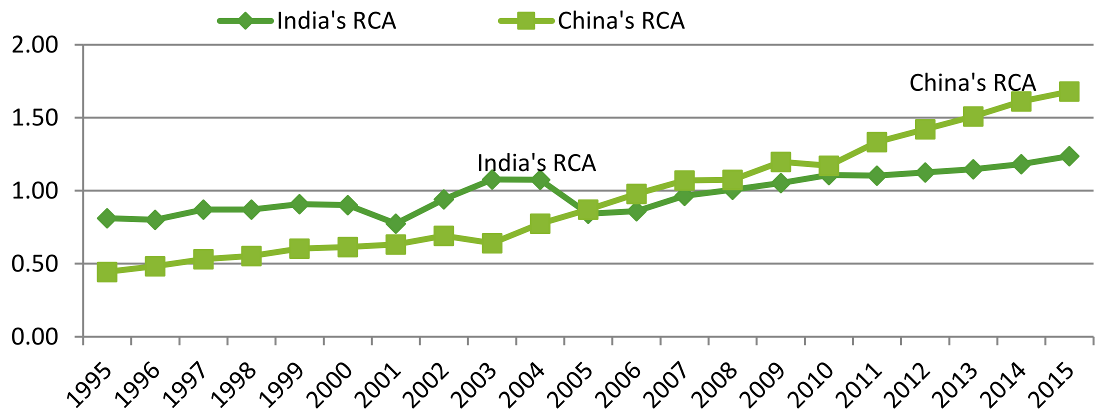
Table 1. Countries RCA of Travel & Tourism's Total contribution to GDP (Bi Decadal Pre Pandemic)

Year	India's RCA	China's RCA
1995	0.81	0.44
1996	0.80	0.48
1997	0.87	0.53
1998	0.87	0.55
1999	0.91	0.60
2000	0.90	0.62
2001	0.78	0.63
2002	0.94	0.69
2003	1.08	0.64
2004	1.08	0.77
2005	0.84	0.87
2006	0.86	0.98
2007	0.97	1.07
2008	1.01	1.07
2009	1.05	1.20
2010	1.11	1.17
2011	1.10	1.33
2012	1.13	1.42
2013	1.15	1.51
2014	1.18	1.61
2015	1.24	1.68

Source: Authors' calculation based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

The revealed comparative advantage year on year basis for the two countries respectively analysed in relation to the World's Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) shows the below trends

Figure 10. Countries RCA of Travel & Tourism's Total contribution to GDP



Source: Authors' calculation based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

China comparatively had lesser advantage in terms of Travel and Tourism's contribution to GDP since 1995 and prior to 2005. The year 2005 has the tip point when both the countries enjoyed almost the same comparative advantages in terms of Travel and Tourism's contribution to GDP; however, China has gained enormously hence after and has shown larger revealed comparative advantage over India which has remained almost static in their comparative growth in relations to the World growth.

Further, the two economies when measured in terms of their Revealed Comparative Advantage (RCA) in relations to the World Travel and Tourism contribution to GDP, it was found that India could achieve parity with World contribution to GDP only since 2008 continuously. China could achieve the continuous parity with the world in terms of contribution to GDP from 2006 onwards. India has been slightly above the world parity (1.24 times) in 2015, and China is way ahead with 1.68 times the World parity. India has to call for more elaborate planning and execution of Travel and Tourism as economic building sector particularly in terms of increasing its income multipliers through tourism.

B. RCA of Travel & Tourism's Total contribution to Employment (Bi Decadal Pre Pandemic)

Similarly, when the WTTC Economic Impact data on Travel & Tourism's Direct contribution to Employment (thousands of jobs) for the two countries respectively was analysed in relation to the World's Travel & Tourism's Direct contribution to employment (thousands of jobs), the revealed comparative advantages are as per Table 2.

Table 2. Countries RCA of Travel & Tourism's Direct contribution to Employment (Bi Decadal Pre Pandemic)

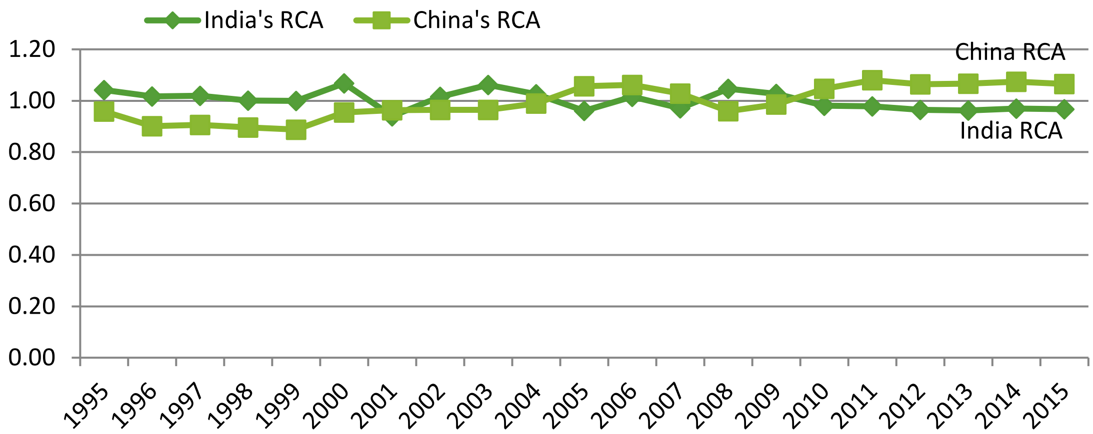
Year	India's RCA	China's RCA
1995	1.04	0.96
1996	1.02	0.90
1997	1.02	0.91
1998	1.00	0.90
1999	1.00	0.89
2000	1.07	0.95
2001	0.94	0.96
2002	1.02	0.96
2003	1.06	0.96
2004	1.03	0.99
2005	0.96	1.06
2006	1.02	1.06
2007	0.97	1.03
2008	1.05	0.96
2009	1.03	0.99
2010	0.98	1.05
2011	0.98	1.08
2012	0.96	1.06
2013	0.96	1.07
2014	0.97	1.07
2015	0.97	1.06

Source: Authors' calculation based on WTTC Data Gateway Economic Research https://tool.wttc.org/

The revealed comparative advantage year on year basis for India and China respectively analysed in relation to the World's Travel & Tourism's Direct contribution to employment (thousands of jobs) shows the trends as represented in Figure 11.

Both countries in study are barely able to match the revealed comparative advantage parity with the World parity in terms of Travel & Tourism's contribution to employment (thousands of jobs). China has able to stay just ahead of World parity, but India has been just below the world parity since 2010. Both countries, however, are devoid of growth of employment generation capacity in the last five years as the trends point to static progress.

Figure 11. Countries RCA of Travel & Tourism's Total contribution to Employment



Source: Graph on Authors' calculation based on WTTC Data Gateway Economic Research https://tool.wttc.org/

India and China are on the upscale growth in terms of revealed comparative advantage on Travel & Tourism's Total contribution to GDP in relation to the World's Travel & Tourism's Total contribution to GDP, but are unable match the RCA for Direct contribution to employment on the same scale. A quick glance over the average Revealed Comparative Advantages in relation to the World by both the countries under study over the period of study (1995-2015) on both contribution to GDP and contribution to direct employment reflects the same. The countries together are unable to pull up the direct employment capacity creation in relation to their respective income growth.

C. RCA of Travel & Tourism's Economic & Environmental Impact (Last 5 years)

The pandemic and post pandemic Economic Impact do not suggest changes but the addition of Environmental Impact does make the study useful in terms of whether the Travel and Tourism future economic growth is leading towards sustainability.

Table 3. Countries RCA of Travel & Tourism's contribution to Economic Impact (2019-2023)

RCA on Contribution to GDP			RCA on Contribution to Employment		
Year	India's RCA	China's RCA	Year	India's RCA	China's RCA
2019	0.94	2.23	2019	0.97	1.43
2020	1.06	1.74	2020	0.91	1.57
2021	0.76	1.63	2021	0.98	1.55
2022	1.14	0.93	2022	1.06	1.29
2023	1.08	1.77	2023	1.06	1.37

Source: Authors' calculation based on on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

However, the study shall remain incomplete without the revealed comparative advantages for environmental impact related to Greenhouse Gas (GHG) emissions in relation to the World emissions.

Table 4. Countries RCA of Travel & Tourism's contribution to Environmental Impact (2019-2023)

RCA on Share of T&T GHG emissions		
Year	India's RCA	China's RCA
2019	0.91	1.18
2020	1.16	1.14
2021	0.88	1.08
2022	1.10	0.66
2023	1.01	0.95

Source: Authors' calculation based on on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

The Revealed Comparative Advantages of Economic Impact in relation to the World by both the countries (Table 3) shows that both the countries have picked up more than the world parity in terms of both Travel and Tourism Contribution to Income and Employment with China picking up higher than India in 2023. An increasing RCA shows an upward growth. India on the both the accounts either remained static or has shown marginal de growth.

Unlike Economic Impact where the increasing RCA shows the growth, the increasing RCA in Travel and Tourism contribution to Greenhouse Gas (GHG) emissions shows the worsening of environmental impact whereby both India and China are almost at parity with the World's GHG emissions. India is better off than China (it had extended Covid lockdown) as it shows the declining RCA in 2023 in relation 2022. However, both the countries need to extensively control their Environmental Impact.

Conclusion and Suggestions

China's tourism is driven by its historical landmarks, modern cities, and strong infrastructure. With strategic investments in high-speed rail and smart tourism, China attracts both cultural and business travelers. India on the other hand holds a strong comparative advantage in cultural and spiritual tourism. With 42 UNESCO World Heritage Sites (as of 2024), it outperforms both China (43 sites, but fewer spiritual routes). India has a advantage over the China with respect to Cultural and Natural Heritage as it offers unique spiritual destinations, varying landscapes and diverse languages and cuisines. Similarly, China offers historic grandeur (Great Wall, Forbidden City) but emphasizes modernization more than the cultural immersion. India needs to step up its campaigns as Incredible India 2.0, Dekho Apna Desh and better global reach. There is much to be done in India with regards to Infrastructure and Accessibility. China leads in transportation and tourism infrastructure, with world-class airports, high-speed rail, and smart tourism initiatives. India needs to tackle the challenges faced by Indian tourism such as inadequate infrastructure in Tier-2 and Tier-3 destinations, Safety concerns for female travelers, Visa and bureaucratic hurdles, Inconsistent cleanliness and hygiene standards, as well as marketing inconsistency. Policy focus needs to shift from promotion to quality improvement.

The Travel and Tourism Revealed Comparative Advantage (RCA) results conclude that the India and China Average RCA on Contribution to GDP in relation to world was respectively 1.08 and 1.31 in the pre pandemic bi decadal period and respectively 0.99 and 1.66 in the last five years that shows the China's better progress in terms of sector's income generation for the country than India. Further, in terms of India and China Average RCA on Contribution to Employment was respectively 0.99 and 1.04 in the pre pandemic bi decadal period and respectively 1.00 and 1.44 that again shows the China's better progress in terms of sector's employment generation. China's Travel and Tourism Economic Impact is certainly skewed towards positive growth than India.

However, the Travel and Tourism Revealed Comparative Advantage (RCA) results show that the India and China Average RCA on Contribution to Greenhouse Gas (GHG) Emission in relation to world for the last five years is respectively 1.01 and 1.00 and is in parity with the World's Greenhouse Gas (GHG) Emissions. India is slightly better off than China (it had extended Covid lockdown) as it shows the declining RCA in 2023 in relation 2022. It may be fairly concluded that India and China need to address the sector's environmental impact rigorously that is sure to bring down the World's Greenhouse Gas (GHG) Emission.

The study may have the limitation of having only few years of data related to economic and environmental impact in the pandemic and post pandemic period and some results may be quite premature. But the pre-pandemic results, particularly for Economic Impact, will certainly give the results a solid background.

Credit Authorship Contribution Statement

Authors contributed equally to this work.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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Elements of the Historical Model City in the Structures of Selected Tourist European Coastal Cities

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Abstract: This paper analyzes selected coastal tourist cities in the Mediterranean region and the Canary Islands. Selected cities were compared with the features of a historical city verified as model cities according to the author's specific methodological key.

As part of the application part, a far-reaching relationship between the above two groups of cities was observed and emphasized. The fact of this relationship creates an extremely favorable situation for the development of the tourism industry, as it introduces a synergistic effect for the development of cultural tourism.

There is a complementary enrichment of both basic functions and forms of tourism - between active tourism and cultural tourism. This phenomenon may result in an additional extension of the tourist season, which is an invaluable value for hoteliers, restaurateurs and service providers.

Keywords: theories of city construction; theory of urban space; tourist seaside cities; UNESCO World Heritage List.

JEL Classification: R11; R12; R14; R30; R51; R58; Q56; P28; O52; N93; N94.

Introduction

The research problem defined in the article can be characterized as follows:

According to the authors, among the coastal tourist cities of the Mediterranean basin, two groups of cities can be distinguished: historical (operating for over 200 years) and contemporary. Both of these groups develop - according to the authors - in different ways. Modern seaside tourist cities are characterized in their functional and spatial structure by the dominance of commercial and tourist functions, especially in the waterfront area, *i.e.* water fronts. However, historical cities develop differently. There is no such strong dominance of the tourist function in the waterfront area. In many countries in the area, this is facilitated by conservation restrictions on historic urban layouts. However, they are no longer able to stop the strong commercial and tourist pressure that is intensively developing in the historic downtown areas of these cities.

The authors of this article decided to analyze this second phenomenon regarding the interdependence of historical structures and the contemporary tourist functions accompanying them. To achieve this, the authors decided to use the subjective, original concept of a model city in the article. Therefore, when analyzing the introduction of the concept of a model city, it should be noted that it is a term close to the concept of an ideal city in the field of urban design, which assumes the search for the best solutions - both theoretical and practical in the area of building multi-aspect urban activities and structures. This topic is widely described in the literature on the ideal city. However, by introducing the concept of a model city - although much less common in literature - the authors avoided the purely theoretical concepts often associated with the concept of an ideal city. The author's idea was to define a formula that would include only examples of complete cities.

The selection of examples of cities recognized by the authors as model cities was determined by their triple verification - first of all, they were realized concepts, not utopian; secondly, they had a high position in the literature on the subject; thirdly, they are on the UNESCO World Heritage List.

According to the authors, a model city should be subordinated not only to aesthetic factors, but also to economic, social and political ones. The article attempts to isolate the features of a model city, assuming their repeatability in the case of research on historical tourist seaside cities today. Five cities were selected for a detailed analysis out of 15 cities located in the coastal belt of the Mediterranean Sea and the Canary Islands area, which met - apart from the model city formula - criteria regarding tourist efficiency, high tourist traffic and - met population indicators below 500,000 inhabitants. In this way, the following were selected: Italian Venice, Greek Chania, Spanish Palma de Mallorca, Cypriot Larnaca and Croatian Dubrovnik. Unfortunately, Malaga had to be omitted from the analysis due to too many inhabitants.

Cities with high tourist intensity were searched for. Historic cities were selected for analysis, *i.e.* those with over 200 years of history and well-developed tourist space.

In turn, the measure used to determine this tourist efficiency was the number of accommodation places and the number of tourists using them.

In the case of the analyzed tourist cities, they were in most cases historical cities, so tourist functions dominated and took over the previous functions of the analyzed cities. Many of these historical cities are characterized by rich architecture, cultural and historical values, which significantly increases tourist attractiveness and allows you to create a tourist offer based on cultural values.

The research question posed was whether there is a correlation between the functional and spatial features of a tourist city shaped in a historical perspective and its functional and spatial structure today with the dominant role of tourism - the next question, as a consequence of the answer to the first one, is whether, and if so, how wide and how numerous these analogies will be. This article is innovative because it offers a new perspective on the development and promotion of tourist cities that base their value on cultural heritage. Interesting architecture can attract tourists, and combined with the cities' coastal location, it offers a full range of both natural and cultural assets, which differentiates such a destination in terms of inbound tourism. The study is important for the tourism sector, which has been experiencing continuous growth for the past four years, and competition in the inbound tourism market is very intense.

1. Analysis of Literature on the Tourist City

Moving on to the analysis of the literature on the subject, attention should be paid to a number of items, although slightly older, but still very important for the area of research. A. Matczak (1989) analyzed the problems of examining the tourist function of cities. J. Warszyńska and A. Jackowski (1978) indicated that tourist towns are ‘spatial units in which tourism is the dominant form of economic activity, commonly referred to as units with a tourist function...’ However, according to R. Baretje and P. Defert (1972), tourist towns are characterized by a high share of employment in services and trade related to tourist services. In small towns, the tourist function has a high chance of gaining a dominant position, which it is unlikely to achieve in large cities (Matczak, 1989).

In recent years, research on tourist cities has been carried out by M. Boivina and G. A. Tanguay (2019), examining the determinants and attractiveness of urban tourism in Quebec and Bordeaux. Analysis based on surveys showed that tourists recognize attractiveness at four levels (context, tourist belt, complementarity, attraction and tourist center). Secondly, elements related to the tourist belt, such as public spaces and the urban environment, are perceived as most important. In order to stimulate tourist attractiveness, the promotion of tourist cities should emphasize the elements related to the "tourist belt". They recommended including tourism in city planning strategies. M. Rodrigo, I. Ajala and A. K. Irhanida (2025) try to modify tourism life cycle model to check the health preparedness at tourism destinations.

The work of R. Shaykh-Baygloo (2019) analyzed tourists' experiences and their satisfaction, as well as a structural model on the example of the city of Shiraz in Iran. A positive impact of attractions on good feelings towards the host city was demonstrated, and tourists' attachment to the tourist destination correlated with the level of satisfaction with their stay.

According to research conducted by T. Teichert, H. Sun, C. Gonz'alez-Martel (2021), city trips provide travelers with various experiences thanks to attractions. The authors examined the sequence of effects related to the ‘tourist experience’ and assessed the so-called the effect of tourism fatigue. However, I. Mohammed, B. D.

Guilletbo and R. Law (2019) analyzed the prices of hotel rooms offered via the Internet, where the pricing policy was based on demand (Mohammed, Guillet, Law, 2019).

Tourism in large cities was studied by A. O. J. Kwok, E. Y. T. Chew (2017) on the example of the city of Sendai in Japan. The city is located 95 km from the Fukushima nuclear power plant damaged by the tsunami, which prompted the authorities to launch a new 'Gambaro!' campaign. Sendai' so that tourism can revive in this city.

The functioning of tourist cities during the COVID-19 pandemic was analyzed by J. Kowalczyk-Anioł and R. Pawlusiński R. (2021). At the beginning of the pandemic, many hotels provided hotel services for medical staff (Napierała, Leśniewska-Napierała, Burski 2020) or were isolation places for infected patients. Hotels in many tourist cities provided meals to medical staff (*Rynek gastronomiczny w Polsce*, 2020) or provided catering services by delivering ordered meals. During the two years of the pandemic, tourist cities were forced to limit hotel operations during the peak waves of COVID-19 virus activity, and when the pandemic situation allowed, they enabled the functioning of the tourism industry and the implementation of the summer tourist season (McCartney 2020; McCartney *et al.* 2021). The fact that tourism activities were limited during the pandemic was associated with reduced tax revenues, and Poland also recorded significantly lower revenues from local and tourist fees. Rebuilding tourism after pandemic in Spain showed increases in air and car travels (Galiano Martínez *et al.* 2025).

2. Elements of a Seaside City - Historical Perspective According to Urban Planning Theories and Theoreticians

It is difficult not to notice that certain elements of the theory of city construction have been consolidated over the centuries in the statements and theses of outstanding space theorists, architects and urban planners. This is important because these tips also apply to the development of coastal cities. The father of European urban planning - Hippodamus of Miletus in the 5th century BC. drew attention in his Treatise on the Formation of the Polis (the treaty has survived only in fragments - as quotations from other ancient writers) to the need to locate central districts in relation to the location of the port in the seaside city (the oldest artificial seaport, *i.e.* built by human hands, comes from Delos) (Parnicki-Pudełko 1985). Hippodamos distinguished three groups of cities, two of which were coastal cities. The first group of coastal cities included port cities, where downtown districts developed on the waterfront next to the port. In such arrangements, the entrance to the port was always secured with a watchtower - in the form of a bastion or an autonomous keep, from which entry into the port bay could be limited and secured with a chain (Kostof 1992; Parnicki-Pudełko 1985).

The second group of coastal cities were the so-called coupled twin cities, located close to each other, which developed complementarily as two cities - a port city and a main city. In such arrangements, the port city performed functions solely supporting the port, and the remaining functions - representative, administrative, commercial - were located in the main city (Mumford 1961).

It was similar in the Roman period and here we can refer to Marcus Vitruvius and his famous work On Architecture, Ten Books (Witruwiusz 1956). He pointed to the seaside location as one of the three most suitable locations for building new cities. He emphasized significant differences between the structures of these cities, resulting from their location. In an inland city, the forum was to be located in the very center of the city, and in a seaside city - in the immediate vicinity of the port (Morris 1979).

During the Early and High Middle Ages, new cities were founded - many of them were coastal cities. In the areas of German influence alone, quoting Z. Paszkowski, in the years 1088-1348, *i.e.* over 260 years, over 3,000 new planned cities were built (Paszkowski 2015). However, no new urban and architectural treatises were created during this period. The authorship of the designs of subsequent cities is also not widely disclosed. The interpretation of this phenomenon, according to Z. Paszkowski, lies in the almost complete takeover of education and science in this period by Benedictine monasteries (the importance of Cluny and the Cluniac reform). If, as he assumes, they were clergymen, it is natural that they did not seek publicity for their work and name, and the knowledge transmitted remained within the monastic teaching system (Paszkowski 2015). Medieval urban planning thought is perceived as autonomous (apart from the pure defensive function inherent in organic structures and physiographic systems), according to researchers such as K. Humpert and M. Schenk. They prove the existence of spatial planning in the Middle Ages, which was quite extensive in geometric format, and the spatial relations introduced during this period (Humpert, Schenk 2001). It should be noted that it was during this period that design practice moved away from the earlier ancient theoretical urban patterns of Hippodamos and Vitruvius.

The Hanseatic city played a huge role in the development and typology of coastal cities already in the Middle Ages. There, the main downtown streets of the city develop parallel to the waterfront and the port, separated from it by a dense network of perpendicular "comb" streets, where trade and goods transactions were carried out directly (Ostrowski 2001).

It was only during the Renaissance that a whole riot of modern secular urban planning and architectural treatises defined the new times (strong secular urban patronage and the Gutenberg reform).

Renaissance cities brought a number of new, often innovative solutions in the context of a seaside city in the writings of theoreticians of that period. According to one of them - Giorgio Martini, who devoted a special place in his work to seaside cities, when building them, the three-dimensional spatial division should be maintained: - the port, the main square of the city and the fortress protecting access to the city and the port. All main streets of the city should lead from these three centers. He also emphasized the privileged role of the waterfront (Zarębska 1970).

The break between theoretical concepts and design practice takes place definitively in the Renaissance period thanks to the implementation of the port city of La Valetta in Malta as a strategic fortress city of the Order of St. John (the evolution of the design from theory to practice is clearly visible in this example and the transformations of three original visions - Simon Genga 1559, Laparello 1565-1569, Girolamo Cassara 1571). Z. Paszkowski also writes about this in his History of the Idea of the City from Antiquity to the Renaissance (Paszkowski 2015).

The industrial revolution brings a change in the rhetoric, scale and needs of newly emerging cities. Cities are growing at a very fast pace. The shipbuilding industry is developing very intensively, permanently changing the image of coastal cities in the 19th and 20th centuries (Kostof 1992).

Table 1. Elements of a seaside city according to the theory and theoreticians of classical and Renaissance urban planning.

Elements of a seaside city according to the theories and theoreticians of classical urban planning	
The inner-city districts and main public spaces of the city close to the waterfront, around the port	Witruwiusz
Twin bipolar cities – a port center and an administrative center	Hippodamos from Milet
The port and the port quay are clearly separated from the historic center by perpendicular streets (la Valetta) and ridge streets (Hanza)	Hanza, project La Valetta
A seaside city based on the three-domain of 1) the city center and the main public spaces of the city, 2) the port, 3) the fortress defending the city and the port, where all 1,2,3 cooperate with each other and are not far from each other	Giorgio Martini

Source: own study.

3. Historic Tourist Cities Present on the UNESCO World Heritage List

Among theoreticians of urban planning and historians of urban development, in the European context, there is a far-reaching consensus as to the distinguishing features connecting them, as well as the examples themselves, of historical cities present on the UNESCO World Heritage List. These are cities that best illustrate a specific era, historical trend or architectural style. It is worth noting that all these cities are currently significant centers of tourist life. Thus, when it comes to the living city of ancient times, the primacy goes to Rome (UNESCO 1990), and in the case of the dead city it is Pompeii (UNESCO 1997) (where Naples is a tourist center) (UNESCO 1995). In the Middle Ages, the most outstanding, most comprehensive example of a Romanesque city is Carcassonne in France (UNESCO 1997), and the Gothic Bruges (UNESCO 2000) in Belgium (Koch 1996; Ostrowski 2001).

The implementation of a model city of the Renaissance era took place in Poland and it is Zamość (UNESCO 1992), which is still increasing its profits from the development of tourism (Gromadzka 2024). In the Baroque era, historiography indicates two examples, only one of which is on the UNESCO list - both are located in France - these are Nancy (UNESCO 1983) and Richelieu. In the period of classicism, St. Petersburg in Russia is undoubtedly the leading example of a city of its era (UNESCO 1990; Koch 1996; Ostrowski 2001). The following years bring a heavy burden to cities, in the form of intensive industrialization and a rapid increase in the number of their inhabitants. Only as a response to these changes can we speak of examples of model cities emerging. So, first, at the turn of the 19th and 20th centuries, we have the implementation of the social idea of the garden city of Letchworth and Welwyn (Great Britain), two very important implementations for the development of urban thought, although both of these examples are not on the UNESCO list. Subsequently, already in the second half of the 20th century, we have examples of modernist cities such as Sydney - on the UNESCO list thanks to the expressionist Jorn Utzon Opera House from that period (UNESCO 2007) and Chandigarh (India) (UNESCO 2007).

Interestingly, please note that only one (Sydney) of the cities listed above is a coastal city (even St. Petersburg is historically located in the Neva Delta on 101 islands - not directly on the sea). Hence, their usefulness in determining the features of a model seaside city remains limited.

4. A Seaside City - a Selection of Features of a Historical City - According to Cities from the UNESCO List

Considering the statement contained in the last paragraph of the previous subsection, selecting the features of a historic seaside city for the purposes of this work is not an easy matter. In this search, according to the authors, four main guidelines should be adopted. The first is the area requirement, *i.e.* the location in the Mediterranean and the Canary Islands and cities located entirely in Europe, while the second is the achievement of a high economic position in its times, as a confirmation of a well-functioning urban organism, as well as the full range of urban functions and activities present, at least historically. The third premise is the high aesthetic importance of the designed and implemented public spaces of these cities, noticed by historiography and distinguished by entry on the UNESCO World Heritage List. There is still a fourth premise - such a city cannot be a dead city with only a few ruins left, or it cannot be a merely modern city (19th and 20th century) growing on the site of a dead city. The adoption of the above premises excludes a number of excellent historical examples such as Delos (UNESCO 1990), Troy (UNESCO 1998), Pergamon (UNESCO 2014), Istanbul (UNESCO 1985), Carthage (Tunis) - (UNESCO 1979) or Ephesus (UNESCO 2015).

At the same time, it implies a number of others, where, apart from the cities selected for analysis, coastal cities of the Mediterranean Sea and the Canary Islands were indicated, included on the UNESCO World Heritage List - characterized by a well-preserved historic old town, small scale - counted in the number of permanent inhabitants. In this way, a group of seven coastal cities was created: Amalfi Corfu, Kotor, Rhodes, Syracuse, Trogir, Valetta, as leading to the specification of repeating, characteristic structures and functional and spatial features - in accordance with the basic UNESCO criterion – *constituting an outstanding work of human creative genius in the field of development of architecture or technology, monumental arts, urban planning or landscape design* (see table 2).

The results of the presented tabulation clearly contradict the characteristics of the seaside city proclaimed by the theorists of the classical period and the Renaissance (See table no. 1). It turns out that the presence of the city center and the most important public spaces of the city have not been historically located (since the Middle Ages) in the immediate vicinity of the port (See the last columns of the table, table no. 2). Interestingly, the only city formula consistent in this respect with Table No. 2 is the Hanseatic city formula developed by numerous implementations of cities in the North and Baltic Sea basins and the reconstruction of La Valetta in Malta as a turning point between theory and practice. Thus, in a very decisive way, the theory - since the Middle Ages - diverges from the historical implementation practice.

5. The Definition of a Tourist Destination and a Model City

Attempts to find a definition of a tourist town or tourist town in the literature have appeared since the 1930s. S. Leszczycki prepared the first typologies of tourist towns on the example of Podhale (Swianiewicz, 1989 after Leszczycki, 1933, 1937). However, A. Jackowski indicated 4 types of criteria used in this type of typologies: physiological, socio-economic, formal-physionomic and genetic-historical (Swianiewicz 1989, Jackowski 1981, pp. 14-20).

However, it should be noted that the problem of defining a tourist destination is complex. A tourist town, according to J. Warszyńska and A. Jackowski (1979, p. 32), is a 'settlement unit' (town, housing estate, village) which, due to its tourist values, tourist infrastructure and transport accessibility, is a destination or stage point of tourist migrations" (Derek 2008, p. 21 after Warszyńska and Jackowski 1979, p. 32). J. Warszyńska and A. Jackowski (1979, p. 32) also indicate that a tourist region is an area that performs a "tourist function based on a certain homogeneity of the features of the geographical environment and internal service connections (...)" (Derek 2008, p. 20 after Warszyńska, Jackowski 1979, p. 32). However, in literature, topics related to the search for the most ideal city concern mainly cities that are to fulfill various functions: residential, economic, commercial, and not touristic.

According to H. Shao, Y. Zhang, and W. Li (2017), for tourists, a city as a tourist destination usually consists of many tourist attractions, these are natural or cultural scenic spots.

Table 2. Features of the historic seaside city– selected cities present on the UNESCO world list

	Coastal tourist towns – historical layouts and functional and spatial features										
	city	region	country	Area km^2	number of inhabitants	UNESCO Access	Presence of a functional and spatial layout or characteristic according to a 3-point scale: 3 – strong; 2 – noticeable; 1 – weak; 0 - the factor does not occur				
	Description of functional and spatial characteristics						The Old Town located by the port.	The Old Town clearly separated by its own boundaries	The location of the Old Town's defence system allows it to protect both the port and the city.	The main public spaces of the Old Town located at the port vs. inside the city	
1	Amalfi	Campania	Italy	6,0	5 421	1997	3	2	1	0	3
2	Korfu	Corfu	Greece	41,9	23 541	2007	3	3	3	1	2
3	La Valetta	Malta	Malta	0,8	5 876	1980	2	3	3	0	3
4	Kotor	Kotor	Monte - negro	335	961	1979	3	3	3	0	3
5	Rodos	Rhodes	Greece	19,48	49 541	1988	2	3	3	1	2
6	Syrakuzy	Sicily	Italy	204,0	117 054	2005	3	3	3	0	3
7	Trogir	Split-Dalmatia County	Croatia	28,8	12 393	1997	3	3	3	1	2

Source: own elaboration.

These attractions are dispersed in urban spaces in specific forms: concentrated in some regions and scattered in others. Users are known to organize their city trips not only by taking into account the distances between different attractions, but also by other factors such as spending levels, interests and similarities between different attractions. Researchers have designated tourist districts, each of which has its main attraction and service center.

In the article by E. Szpakowska (2013), three cities were analyzed as the most perfect historical examples: a religious city, a monarchical city, and a city of class society. The development of the mentioned examples of cities was an iconographic reflection of the structure and ideals of the society inhabiting them. The most important object was located in the center, *i.e.* a sacral building or the ruler's residence. Due to the fact that the type of tourist attractions determines different types of tourism, the different layout of the urban tissue is also the focus of the article on a seaside tourist city.

It should also be noted that the analyzed tourist cities play an important role in the context of the development of cultural tourism. Cultural tourism is "visiting places with high tourist and historical values that constitute human cultural heritage. It is therefore a visit to architectural monuments, archaeological excavations, places associated with famous people, artistic exhibitions, galleries" (Mikos v. Rohrscheidt 2008 after Marczak, 2000, p. 47). In the case of the analyzed areas, it is a very important element of the tourist destination related to the development of tourist development around the historical site. downtown, as well as due to the proximity of the coastline. The combination of these two areas provides great opportunities for diversified recreation, for example by combining active tourism (including water tourism) with cultural tourism.

6. Development of a Seaside Tourist Town

The specificity of tourist values in the coastal zone favors the creation of a set of settlement units that have a tourist character (Jażewicz, 2009). Settlement units located in the coastal zone were subject to functional changes (they often went through similar stages: first a fishing settlement, then an agricultural function, and finally a tourist function) (Jażewicz 2009 after Szwichtenberg 2006).

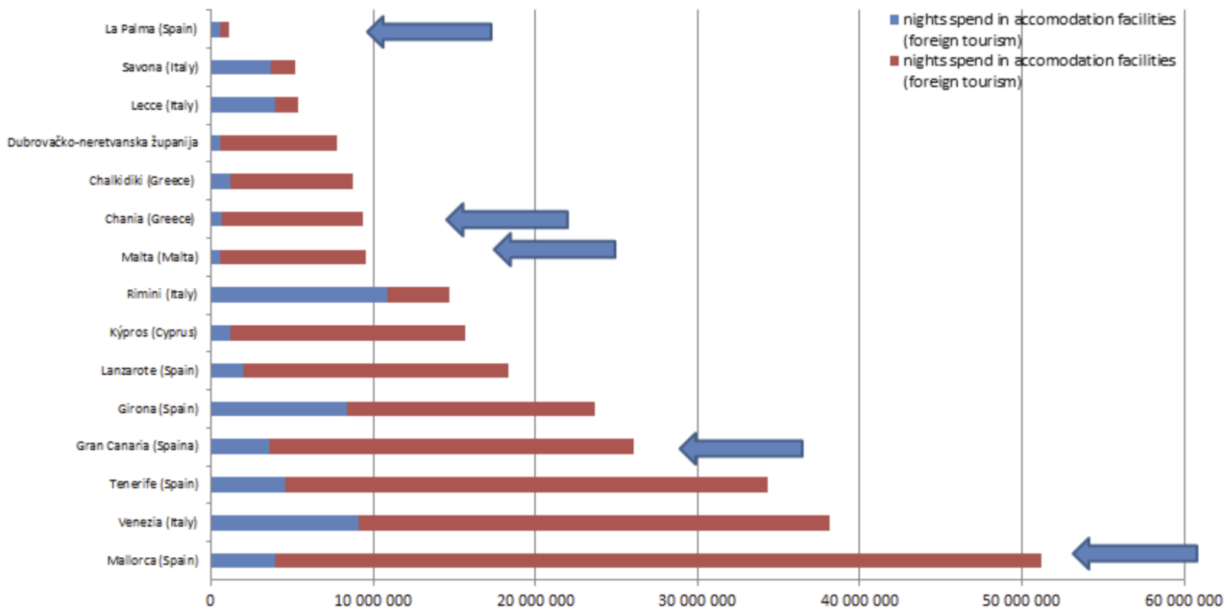
When analyzing specific tourist destinations, it is worth mentioning the tourist destination development cycle model of R.W. Butler (1980). The model describes the level of development of a tourist destination over time, considering fluctuations in the number of tourist arrivals. The first stage was called pre-development, in the second stage the tourist function appears, and the area is explored by tourists (Butler, 1980). Then the first hotels begin to operate, and then the hotel development along the beach develops. In the next stage, a hotel and service center appeared, located much further from the beach. Later, hotels are located far from the coastline, followed by lower standard facilities, including second-row buildings. In the final stage, the seaside hotel district is separated from the commercial and service part located inland (Butler, 1980, Jung, Kwon, Hung-Kwan Park, 2005).

In Butler's model, at the final stage, three further paths are possible: further development, stagnation or collapse of the tourism function. The development of seaside tourist destinations was presented by A. Kowalczyk (2001, p. 38). However, this model fits perfectly if a tourist city is just being created, and the situation is completely different when we are dealing with a historic city that is starting to welcome tourists. Certain elements appearing in Butler's model can be observed for historical tourist cities (such as the shift of residential buildings away from the "water front" line, as well as the shift of hotel development of lower category facilities from the "water front" line).

7. Selection of Tourist Cities for Analysis

Below, based on Eurostat data, a table of all tourist regions and cities characterized by a large number of accommodation facilities and, consequently, a high rate of tourist traffic intensity is presented. Large cities with over 500,000 inhabitants were omitted from the analysis inhabitants (*e.g.* Naples, Valencia, Barcelona). The Canary Islands were also added to the cities of the Mediterranean basin as Spanish territories. From the list of cities with the highest tourist traffic, coastal tourist cities were selected for analysis. These are cities characterized by a high degree of tourist development in terms of accommodation facilities. The number of accommodation facilities provided by the Statistical Office of the European Union - Eurostat according to the administrative division at the NUT3 level was used. Coastal cities were selected for analysis, excluding large cities (Figure 1).

Figure1. Number of overnight stays for tourists in selected cities and coastal regions of the European Union at the NUTS 3 level (excluding large cities) in 2023



Source: own study based on Eurostat data – www.ec.europa.eu/eurostat

8. Analysis of tourist coastal cities

When analyzing individual cities, it is also necessary to consider at what stage of development of a tourist destination, according to R. Butler's tourist destination cycle, each of the places analyzed. In most cases, these are mature tourist destinations (see Table 3).

Table 3. Basic data on the analyzed tourist cities

Lp.	City	The date of establishment	Population (thousands)	Surface (sqare km)	Number of collective accommodation facilities	Tourist traffic	Number of accommodation facilities per 1,000 inhabitants	Country
1.	Venice	697 n.e.	255	415,9	29 367	4,7 mln (2019)	115	Italy
2	Palma de Mallorca	123 p.n.e	400	208,6	1 658	9 mln (2018)	4	Spain
3.	Chania	3400 p.n.e	53	12,6	1 579	1,3 mln (2022)*	29	Grecce
4.	Larnaka	daw.Kition XIII p.n.e	51	32	771***	4,8 mln***	15	Cyprus
5.	Dubrownik	VII n.e.	42	143	2 1729**		65	Croatia

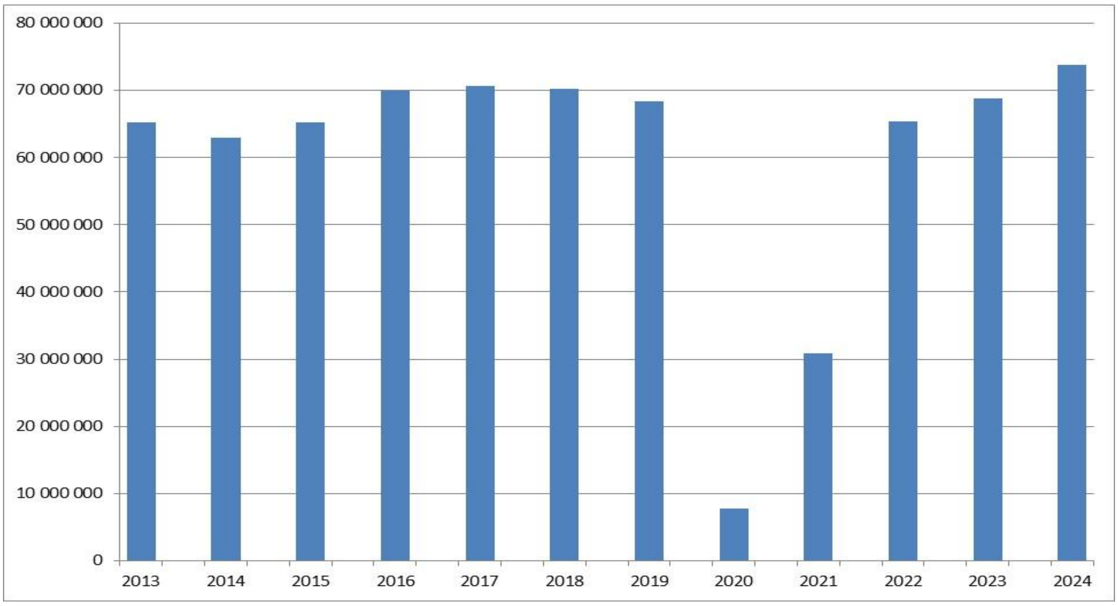
Source: own elabroation*www.crete.pl – 31.05.2024). data for November 2022 r.**Croatian Bureau of Statistics – www.web.dzs.hr, *** data for Cyprus.

8.1. Palma de Mallorca on Balearic Islands

Palma de Mallorca, with an area of 213 square km, is the capital and largest city of the Balearic Islands. The city was founded in 123 BC. It is also called one of the largest tourist centers in the world. There are over 200 hotels located here. There is one metro line in the city. One of the most popular ports for large cruise ships is also located in the city.

The city is known for its large number of restaurants, bars, clubs and discos. The population is 409.6 thousand and the population density is 5,100 people per km2. However, the city authorities intend to limit the inflow of tourists during the tourist season due to the protests of residents (www.radiozet.pl). During the COVID-19 pandemic, the Balearic Islands faced a huge crisis due to the restriction of hotel operations. However, clear rules regarding the acceptance of Covid passports allowed the Balearic Islands to rebuild tourism quite quickly in the post-pandemic period. This is due to the return to the level of overnight stays for the Balearic Islands region until the pre-pandemic year, *i.e.* 2019. The city has a clearly visible tourist waterfront with a large number of marinas and ports. In the entire Balearic Islands region, in 2022 the number of post-winter overnight stays from before the COVD-19 pandemic was not yet recorded, but it was a very similar level (in 2022 it was 65 million people). In 2024, tourism has recovered to pre-pandemic levels, but residents already in the high season indicated that the tourist traffic was too overloaded – more than 70 millions (see Figure 2).

Figure 2. Number of overnight stays for the Balearic Islands region in 2013-2024



Source: own study, according to Eurostat data

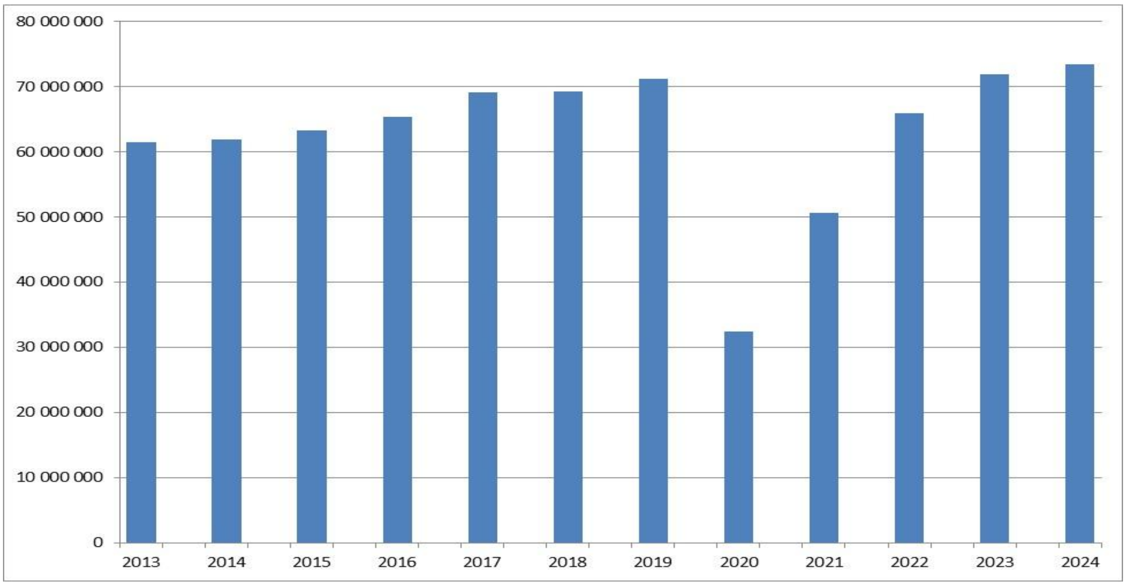
8.2. Venice

Venice is a city in northern Italy with a population of approximately 260,000 inhabitants, including the historical part, inhabited by 60 thousand. It is a city with a very long history, founded in 697 AD. Venice is a global tourist city.

The monuments of Venice form a unique urban complex consisting of canals and bridges. Around Venice there is the Venetian Lagoon, included on theUNESCO World Heritage List. Because the city is located on islands, its layout is slightly different from a typical tourist coastal city. Of course, the city influences the entire region. It is also an attraction for the domestic market and domestic tourists. Figure 3 shows the dynamics of tourism reconstruction after the COVID-19 pandemic. In 2022, 63 million overnight stays were provided in the Venetio region, which means a return to the level of 92% to the level before the COVID-19.

Annually before the COVID-19 pandemic, 4.7 million tourists visited Venice. Analyzing these values in relation to the number of local populations, this gives an 18-fold higher number of tourists visiting Venice per year. Such a high tourist traffic intensity index may also indicate tourist overload, which may be unfavorable for local residents (inflationary pressure, difficult access to catering and cultural services during the tourist season). Analyzing the data from 2022, we can clearly observe that the entire Veneto region has not reached the number of overnight stays provided before the COVID-19 pandemic, *i.e.* in 2019, but it is a very similar level (in 2022 it was 65.9 million). In 2024 the number of overnight stays returned to the pre-pandemic level (more than 70 millions of overnights stays in Veneto region).

Figure 3. Number of overnight stays for the Veneto region in 2013-2024

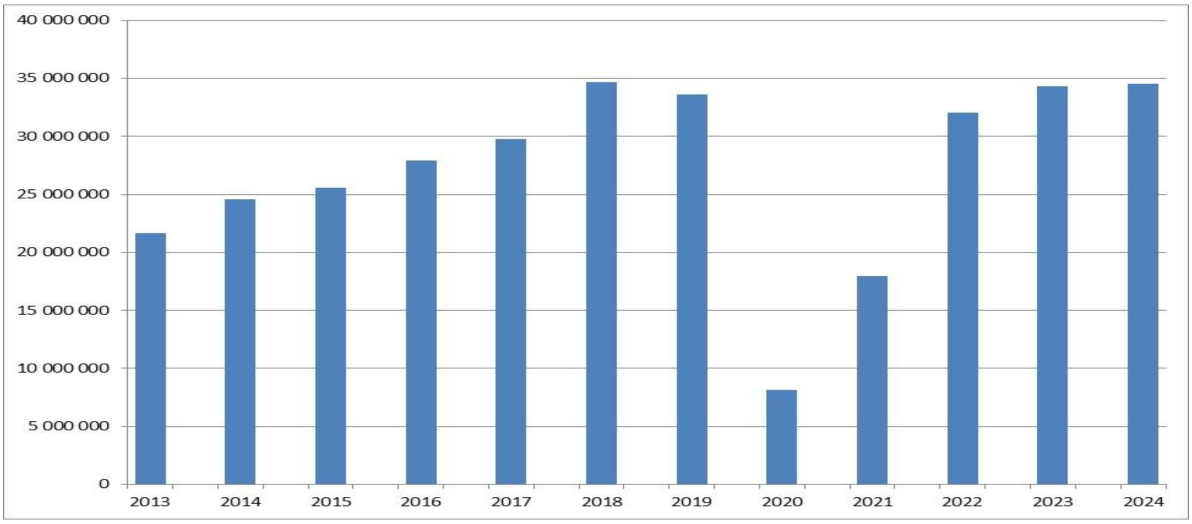


Source: own study, according to Eurostat data

8.3. Chania (Grecce – Crete)

A city in Greece with an area of 12.5 square located on the north-west coast of Crete. Approximately 53.9 thousand people live in the city. inhabitants, which gives a population density of 4.7 thousand inhabitants per 1 km2. Currently, Chania is characterized by an attractive waterfront port district and "Venetian buildings". A city with a very long history, founded in 3400 BC. Analyzing the data from 2022, we can clearly observe that the entire region of Crete has not reached the number of overnight stays provided before the COVID-19 pandemic, *i.e.* in 2019 (but it is a very similar level). In 2022, it was 32 million overnight stays for the Crete region. It can be assumed that in 2024, with almost 35 million overnight stays, the volume of tourist movement has returned to the pre-pandemic level (see Figure 4).

Figure 4. Number of overnight stays for the Crete region in 2013-2024



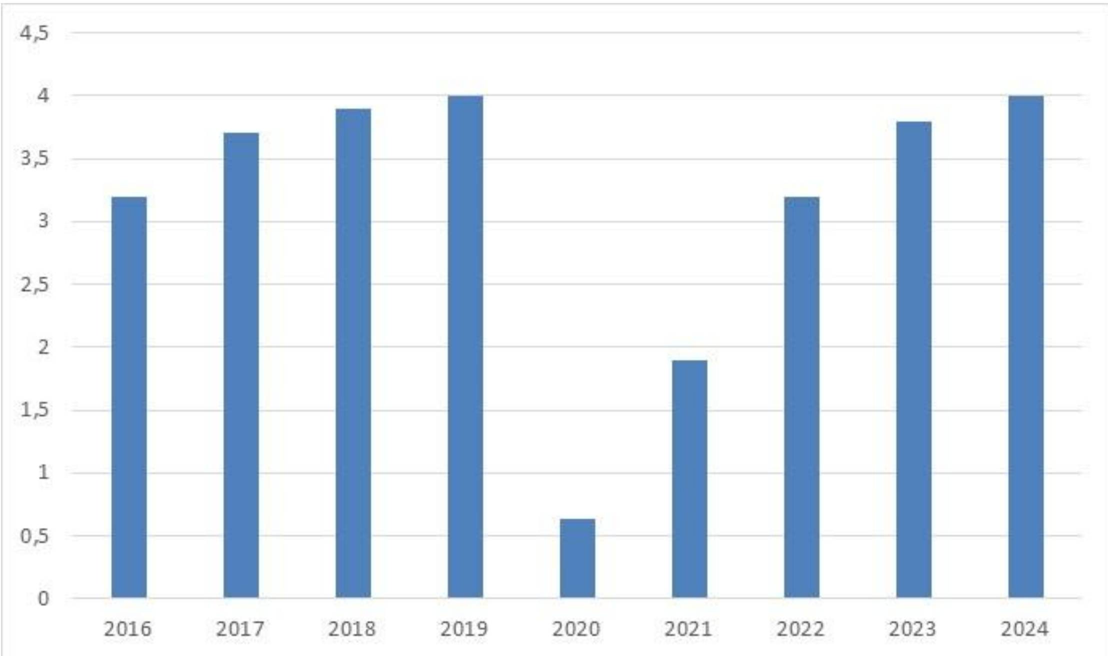
Source: own study, according to Eurostat data

8.4. Larnaka (Cyprus)

Larnaca is a city with an area of 32 sqare km and a population of 51,000. Formerly known as Kition, the city was founded by Phoenician colonists in the 12th century BC. and was one of the oldest Phoenician colonies. Larnaca is an important communications center with an international airport and the port of Larnaca. Larnaca has excellent location conditions in relation to the emissions markets in Western Europe by air transport.

In addition, Cyprus has excellent climatic conditions and copes well with the seasonality of tourist movement. The tourist season can last from the beginning of May to the end of October, and the big advantages that extend the tourist season are the Fort built in the 17th century by the Turks, the aqueduct from the 18th century and the ruins of the ancient city of Kition. The volume of tourist traffic in Cyprus has not returned to pre-pandemic levels and is at the level of 84% of the traffic before the COVID-19 pandemic. Larnacais the city that recorded the level of tourist movement similar to 2019 only in 2024 (for the whole Cyprus it was 4 millions of tourists arrivals in 2024). This is the area among those analyzed that was the slow in rebuilding pace of its tourist movement after the pandemic.

Figure 5. Number of foreign tourist arrivals to Cyprus in 2016-2024

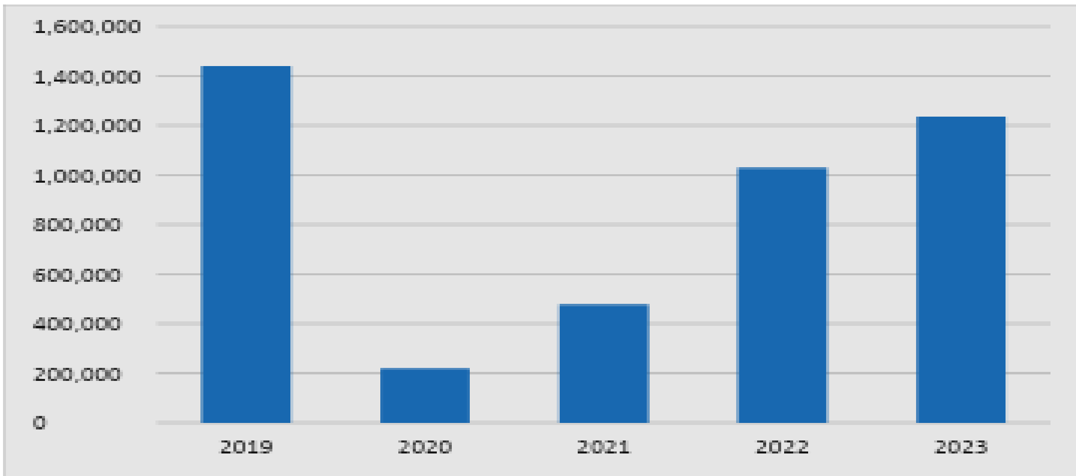


Source: own study, according to Eurostat data

8.5. Dubrovnik (Croatia)

Dubrovnik is a city with an area of 143.35 km2, located in southern Dalmatia on the Adriatic Sea. The number of permanent residents of Dubrovnik is 42.6 thousand people (data from 2020). Historically, Dubrovnik played a leading commercial role of European importance. Currently, Dubrovnik is mainly a tourist city. Its historical splendor was honored by being inscribed on the UNESCO World Heritage List (Accession 1979). Dubrovnik's popularity gives it a clear priority in the number of visitors, not only among other Croatian cities, but it is also a significant tourist destination on a European and global scale. Thanks to its physiographic values, skillfully used in the Middle Ages (reconstruction and city status from 1272), the city acquired a unique silhouette of the arrangement of individual districts at different relative heights, reminiscent of the structure of a Roman amphitheater, but applied on a much larger scale - on an urban scale.

Figure 6. Number of overnight stays in Dubrovnik in 2019–2023



Source: own study on basis: www.podaci.dzs.hr/media/pt0dpwn5/si-1731_turizam-u-2023.pdf

The lowest part of the city - the foundation part, with the famous street corsoPlaca - begins with the leveling of the area in the place of the buried sea isthmus. Originally, the city was located entirely on a rocky island connected to the mainland by a narrow causeway. The second part of the amphitheater structure results from the land sloping steeply into the sea on the northern shore of the Adriatic Sea. New districts were also built there, rising upwards in terraces. The city owes its rapid development after the reconstruction to four monasteries founded in four places on the outskirts of the city. They were the driving force of the city's prosperity, as they provided city-forming services and goods of general use (hospitality, education, pharmacy, bakery, crafts, printing and others). In the early Middle Ages, the city was associated with Byzantium, and after the departure of the Eastern Empire from the Adriatic Sea basin, Dubrovnik came under the influence of Venice (from 1204).

Today, Dubrovnik is one of the most perfect examples of classical composition in world urban planning. The tourist base is very wide and versatile. The most expensive hotel rooms are located in the old town.

In the case of the city of Dubrovnik, unfortunately, it may take several years for tourism to recover to pre-COVID-19 levels. In 2023, it was the level of 85% of tourist traffic before the COVID-19 pandemic, *i.e.* the level of 2019 (Fig. 6).To summarize the above analysis of tourist coastal cities - it should be noted that the real effects of the pandemic's socio-economic impact on tourist cities, but not only them (also in other cities and other areas of development), are subject to a high risk of error and their actual size will be possible to precisely determine only in a few years.

Conclusions. The Structure of a Tourist City - Repeatability of the Model

The analysis took into account Spanish, Italian, Greek and Cypriot historical cities. The relative proximity of the coastline is undoubtedly a location factor for accommodation facilities.

Usually - in modern tourist cities - 5-star hotels are located in the immediate vicinity or up to 300 meters from the coastline. Of course, the possibility of renting rooms with a sea view is included in the price of services in such facilities. There is a 3–4-star hotel located 300 meters to 1 km away. Then, at a distance of 1 to 2 km, there are lower category facilities, youth houses and rest-houses. In the historic tourist cities of the Mediterranean, however, the structure is different - some common elements can be identified regarding the layout of urban space and, as a consequence, the gentrification of this space. This article is innovative because it shows spatial development in tourist cities that base their values on cultural heritage. Interesting architecture attracts tourists, so rapidly that the cities are adding special tourist tax. The study is important for the tourism sector with continuous growth between 2022-2025 both domestically and in terms of foreign tourists' arrivals.

It should be noted that the selected coastal tourist cities selected for analysis (Chania, Dubrovnik, Larnaca, Palma de Mallorca, Venice) repeat the elements of the historical model city that were identified in Table 2 (see Table 2). There is a clear relationship between tourist and historical models. At the same time, the selected tourist cities are not similar to the basic values of the theoretical model (See Table 1).

When confronted with the diagram shown in Figure 7 (model of a modern seaside tourist city), Figure 8 - we can notice that in the case of historical seaside tourist cities, the strip of high-standard hotels does not supply the waterfront strip as in the modern model - that is, it does not repeat the theoretical pattern (See Table No. tourist development).

As a result of the conducted research and analyses, the authors concluded that there are interdependence and even significant repeatability in the occurrence of specific features of a tourist seaside city, based on the formula of a model city in the urban and spatial dimension in the past. In other words, the tourist model of such cities, determining its position and tourist role today, is part of the historical spatial model (See Figure 8.)

In conclusion, it should be noted that the historically developed structural and spatial model of seaside cities (see Table 2) has found a new dimension as a contemporary model of a historical seaside tourist city. As a result of the analyses conducted in response to the research questions, it should be stated that there is a far-reaching relationship between the image of a tourist city, in the perspective of the historical model (see Table 2), and its position and role in tourism today. The conclusions drawn from the research are even more far-reaching. It can be noted that the spatial historical model has been adapted to new tourist needs, is its continuation and grows out of it. An important factor here is the development of cultural tourism, related to visiting the city, its historical downtown and learning about its history, including the history of architecture.

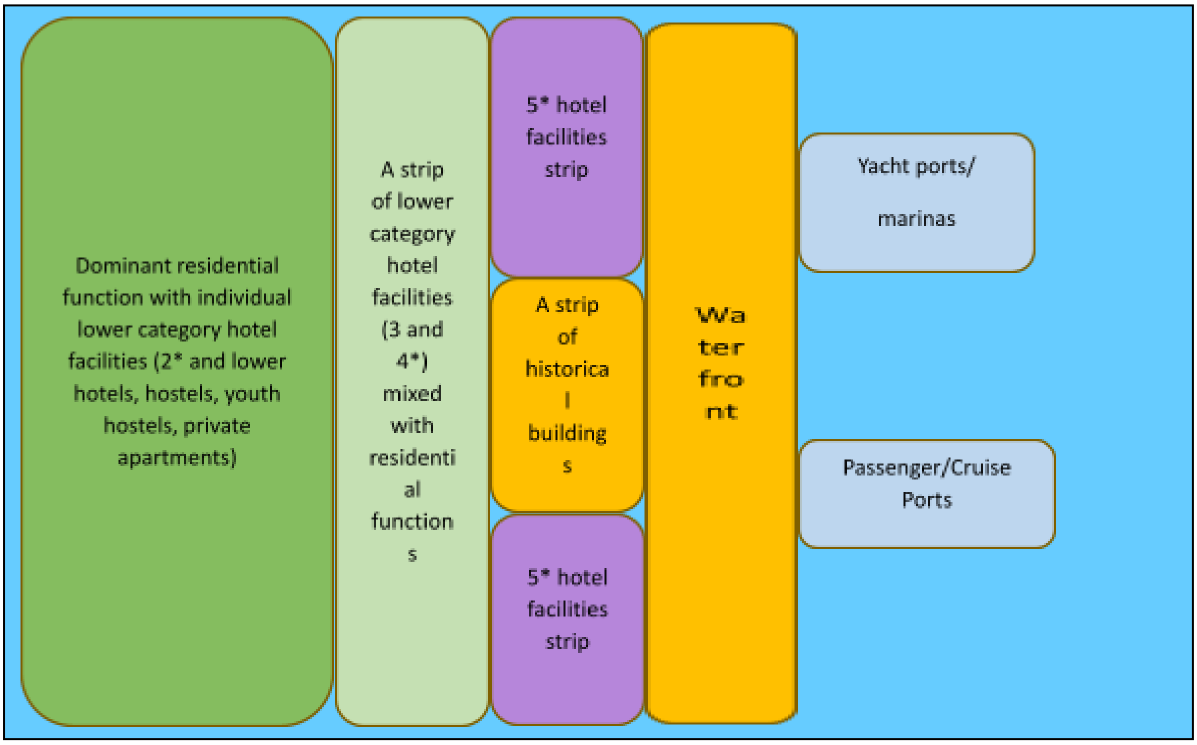
This relationship is extremely beneficial, as it introduces a synergetic effect for the development of cultural tourism. There is a complementary enrichment of both basic functions and forms of tourism - between active tourism and cultural tourism.

Figure 7. Differences in the directions of tourism investment expansion between modern coastal cities (A) and historic coastal cities (B). In historic cities, tourism investments (hotels, recreation) accompany the historical fabric without occupying the waterfront. In cities built today (cities built from scratch), tourism investments (hotels, recreation) encroach on the waterfront

Source: own compilation based on: https://www.dreamstime.com/whimsical-illustrated-map-coastal-town-vibrant-buildings-cobblestone-streets-lush-greenery-large-churches-image359521025; The Beach City Map Stevonnie PNG has a transparent background https://imgbin.com/png/tA94vpnh/beach-city-city-map-stevonnie-png

For the analyzed areas, it is important to include tourist development around and often inside the historic 'old town', adjacent to its public spaces, which provides opportunities to combine active tourism with cultural tourism and makes recreation in such areas more harmonious and versatile.

Figure 8. Model of a modern seaside tourist town



Source: own study.

In combination with climatic conditions, it provides opportunities to extend the tourist season in these areas, which is extremely desirable for service providers. In addition, the climatic conditions of the analyzed cities also indicate that they have an ideal climate for the development of tourism with a longer tourist season (although the summer peak of the tourist season may already be too hot for some groups of tourists - the elderly, families with small children). However, there are ideal conditions for extending the tourist season - for example, in Larnaca, the number of hours with sunshine is almost 3.5 thousand per year (www.moa.gov.cy), and on average the sun shines 300 days per year.

Credit Authorship Contribution Statement

Katarzyna Podhorodecka: author of the article concept, author of the text, researcher responsible for collecting source data, data analyst.
Jacek Kwiatkowski: author of the text, data analyst, editor of the final version and conclusions.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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Reframing Festivals: From Celebration and Tourism to Cornerstones of the Creative Industries

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Abstract: Festivals have emerged as multifaceted phenomena that not only drive cultural consumption and stimulate tourism but also function as creative hubs integral to the growth of the creative industries. This conceptual study synthesizes existing literature and real-world examples to examine the interconnections between festivals, tourism, and the creative industries, positioning festivals as essential contributors to the creative economy. Rooted in the cultural and creative sectors, festivals attract travelers and serve as platforms for artistic innovation, knowledge exchange, and the formation of temporary creative clusters. They contribute to socio-economic development, urban transformation, and place branding, while strengthening the activities and networks of the creative class. The article highlights the dual role of festivals in both cultural consumption - through performative culture and tourism - and creative production, emphasizing their capacity to foster education and innovation. It further proposes a conceptual framework that captures the dynamic interplay between festivals and the creative industries, addressing existing gaps in institutional recognition and academic discourse.

Keywords: festivals; tourism; creative industries; urban and regional development; festivals as creative hubs.

JEL Classification: R11; L83; Z10.

Introduction

Festivals are growing rapidly in both number and variety, offering people a break from daily routines and an opportunity to enjoy cultural, entertainment, and social experiences (Davies 2015; Finkel and Platt 2020). Beyond entertainment, they also play a vital role in economic development - particularly through tourism and investment - aligning with the principles of the experience economy (Cudny 2016) and contributing to culture-driven territorial branding (Bianchini 1993; Quinn 2005; Degen and Garcia 2012; Zherdev 2014; Díez-Pisonero, 2025).

One of the most frequently discussed features of festivals in academic literature is their ability to attract tourists. Visitors are drawn to destinations hosting such events by the promise of fun and extraordinary experiences (Laing 2018). The most common motivations for attending festivals include the desire to experience culture, spend leisure time in an engaging way, enjoy the distinctive festival atmosphere, spend time with friends and family, and meet new people. People traveling to festivals participate in festival tourism being a part of cultural tourism (Ratkowska 2010; Cudny and Ogórek 2014; Rossetti, 2024). Festivals are often organized in tourist destinations during peak seasons as additional attractions complementing leisure or sightseeing. In this sense, they function as tourist attractions - elements that enhance the tourism product of various destinations - and, without a doubt, represent a form of cultural consumption based on extraordinary experiences (Johannson and Kociatkiewicz 2011; Cudny 2016).

Recent academic research increasingly highlights strong links between festivals and the creative industries (Alvarez 2010; Rofe and Woosnam 2016; Richards 2016; Johansson and Toraldo 2017; Black *et al.* 2024; Islam and Sadhukhan, 2025). Rooted in the cultural sector, creative industries encompass a wide range of activities, from the arts and performance to IT, media, video games, architecture, and design. These industries are recognized as engines of social and economic development, with their growth closely tied to the rise of the so-called creative class (Stryjakiewicz *et al.* 2010, 2014). Festivals are often created and led by members of this class - artists, local creatives, and game developers among them (Visser 2005; Brennan-Horley *et al.* 2007; Cudny and Rouba 2012; Kang *et al.* 2014).

Traditionally, scholars have examined festivals and creative industries through the lens of cultural consumption and urban development. They are seen as key components of the creative economy, driving tourism and enhancing the attractiveness of specific places (Cudny 2016). However, festivals are more than just consumer experiences - they also serve as platforms and nodes for creative thinking, education, and artistic production. Many functions as incubators for new ideas, performances, and trends (Prentice and Andersen 2003).

The connections between festivals and the creative industries are therefore multifaceted. They extend beyond economic impact to include creative production, temporary creative clusters, network-building, business development, and educational innovation - all of which contribute to the vitality of the broader creative class. Despite this, festivals are still commonly perceived primarily as consumption-driven events or tools for place branding. There has been relatively little institutional effort to formally integrate festivals into the framework of the creative industries, and comprehensive studies explicitly positioning festivals within this context remain limited.

This article seeks to address that gap. It consolidates existing knowledge on festivals and their relationship with creative industries, highlighting how deeply interconnected these spheres are. The first research goal is to present classical perspectives on festivals as drivers of tourism and local growth. The second is to position the festival sector as a legitimate and essential component of the creative industries. The article also aims to identify key areas where these connections are most visible - drawing on both institutional and traditional perspectives - while emphasizing the potential of festivals to function as creative hubs for cultural production, education, and innovation - presenting a deeper approach to festivals and creative industries.

The scientific novelty and importance of this study lie in its integrative approach to understanding festivals not merely as cultural consumption events or instruments of place branding, but as dynamic components of the creative industries. While existing research has primarily focused on their touristic and economic dimensions, this study advances the discussion by positioning festivals as active nodes within creative ecosystems - spaces of artistic production, innovation, and knowledge exchange. By bridging the conceptual gap between festival studies and creative industry frameworks, it highlights how festivals contribute to creative cluster formation, business development, and education, reinforcing their role as incubators of creativity and local development.

1. Methods

This article is a conceptual paper. The main goal of a conceptual article is to propose new frameworks, models, or concepts that advance understanding within a specific field. Conceptual papers also develop models and theoretical propositions that can be tested through future empirical research. These models are constructed through the summarization and synthesis of existing knowledge drawn from secondary materials, such as academic publications, reports, and credible online sources. Conceptual articles therefore integrate previous findings and offer new ways of thinking about a problem, phenomenon, or theory. In scientific research, conceptual articles play an essential role in theory building and intellectual development. They help identify gaps in existing literature; challenge established assumptions and provide fresh perspectives that can guide future empirical studies. Such papers often serve as a foundation for generating hypotheses, designing research methodologies, or redefining key constructs within a discipline (Jaakkola 2020; Reese 2023).

The goal of this conceptual article is to identify and analyze scholarly literature that connects festivals with the creative industries, aiming to uncover how festivals reflect various forms of creativity and contribute to their development. The analysis adopts a dual perspective: on one hand, it explores established themes rooted in institutional and traditional socio-economic views of festivals - as tourist attractions, events for cultural consumption, and vehicles for place promotion and development. On the other hand, it examines newer and more nuanced perspectives that offer alternative understandings of how festivals intersect with creativity, creative industries and the broader creative economy.

The literature review began with keyword searches in the Scopus database, using terms such as *festival*, *creative industries*, *creative cities*, *creative class*, and *events*. These keywords were chosen because they represent the core of current discussions on how cultural events relate to urban and economic transformation. Initial filtering focused on whether these terms appeared in titles, abstracts, or keywords.

Subsequently, abstracts were reviewed to assess their relevance, with particular attention to works offering conceptual or empirical insight into the relationship between festivals and creativity - especially through the lens of the creative industries or the creative class. Selected texts were read in full to extract key themes, theoretical approaches, and empirical findings. Additional relevant works were identified through reference lists, ensuring a comprehensive and integrated understanding of the topic.

To enrich the analysis and ground it in real-world practice, the literature review was complemented with examples from online sources - including festival websites, digital media, and publicly available reports. Additionally, elements of autoethnography were incorporated, drawing on personal experiences and observations from attending creative festivals and cultural events (see: Butz and Besio 2009; Ellis *et al.* 2011).

This combined methodology - integrating academic sources, digital content, and lived experience - seeks to present an interconnected, and multidimensional view of how festivals foster creativity and contribute to the evolving dynamics of the creative industries and economy.

2. Theoretical Background: Defining Festivals, Festival Tourism and Creative Industries

2.1. Festivals

Italian sociologist Falassi (1987, p. 2) stated that "Festival commonly means a periodically recurrent social occasion in which, through a multiplicity of forms and a series of coordinated events, participate directly or indirectly and to various degrees all members of the whole community, united by ethnic, linguistic, religious, historical bonds, and sharing a worldview." Davies (2015, p. 535) wrote that, "Festivals are distinctive because they take people outside their normal behaviours in time and space. They provide unusual activities and evoke feelings and emotions that are very different to the regular and material routines of the workday. Traditionally most took place in spaces that are either normally used for other activities such as roads or empty spaces but later become the exclusive sites for the period of the event - sites usually temporarily transformed by decorations and events."

Gibson *et al.* (2011) described festivals as unique occasions filled with ceremonial entertainment, spectacles, and acts of remembrance. They unite people, with participants seeking extraordinary experiences and the pleasure of coming together. According to Quinn (2005) festivals are exceptional, creative events that transcend the ordinary and must cultivate a unique atmosphere rooted not only in artistic excellence but also in the locale's traditions and heritage. Gibson and Stewart (2009, p. 6) stated that "To qualify for inclusion as a festival, an event had to meet at least one (and preferably more than one) of the following criteria: use of the word 'festival' in the event name; it being an irregular, one-off, annual, or biennial event; emphasis on celebrating, promoting, or exploring some aspect of local culture; or being an unusual point of convergence for people with a given cultural activity or specific subcultural identification."

Festivals are organized events embodying various expressions of human culture, allowing people to gather during leisure time. They contribute to the production and consumption of culture and are inherently creative, showcasing human ingenuity across multiple domains. Since human culture encompasses both tangible and intangible elements, there exists a vast array of festival types (Waterman, 1998). These include arts festivals like Glastonbury, Cannes Film Festival, Edinburgh Fringe, and Frankfurt Book Fair; festivals celebrating customs like the Rio Carnival; religious festivals; science events like the World Science Festival; food and wine festivals like Oktoberfest; fashion weeks; multicultural events; LGBTQ+ festivals like San Francisco Pride; and many others. This diversity highlights the wide range of themes around which festivals are organized (Cudny, 2016). They are brought to life by creative individuals such as artists and scientists. Festivals often serve as platforms for emerging talent, providing opportunities for new creators to showcase their work to wider audiences (Larson, 2009, 2011).

Festivals fulfil numerous functions: they entertain, provide access to culture, and help build cultural (Getz, 2010; Rossetti and Quinn, 2021) and social capital (Cudny and Ogórek, 2014). They strengthen community identity and pride, fostering a sense of belonging among participants and residents. As social gatherings, they facilitate human interaction and contribute to economic growth through revenue from festival tourism. The construction of the Palais des Festivals et des Congrès in Cannes, driven by the Cannes Film Festival, illustrates how festivals can lead to significant infrastructure development. Additionally, festivals are prominent media events featured in both traditional and social media, becoming tourist attractions and branding opportunities (De Valck, 2007; Cudny, 2022).

The rise of festivals gained momentum after the Second World War when average incomes increased, people sought new and extraordinary experiences, and there was more leisure time (Cudny 2016). In many developed societies, a growing desire emerged to participate in unique experiences - a phenomenon known as the experience society (Schulze, 2008) and economy (Pine and Gilmore, 2011). Naturally, festivals, being extraordinary and unique events, became the ideal medium to provide such experiences (Waterman, 1998).

2.2. Festival Tourism

Festival tourism is a form of cultural tourism in which people travel to a destination primarily to attend, experience, or participate in festivals or special cultural events (Cudny 2013). In cultural tourism, travelers are interested in exploring attractions connected with human culture, understood as the collective achievements of human civilization. Within cultural tourism, several forms can be distinguished, such as sightseeing, museum tourism, heritage tourism, and festival tourism, among others (Kowalczyk 2008; Du Cros and McKercher 2020; Richards and Leal Londoño, 2022).

Festival tourism involves visiting destinations to enjoy music, art, food, religious, historical, or seasonal celebrations that provide insight into the art, traditions, lifestyles, and identities of local communities. Travelers seek extraordinary experiences associated with the festival atmosphere - such as performances, social interactions, and connections with others, including friends, family, or new acquaintances met during the event (Cudny 2014, 2016; Kinnunen *et al.* 2025).

Visiting festivals as part of cultural celebrations encourages cultural exchange between locals and visitors. Festivals function both as tourist attractions and as tourism products that generate tangible and intangible effects: they often boost the local economy and stimulate the tourism industry (Quinn 2006, 2019; Richards and Leal Londoño 2022). Moreover, festivals are an essential part of cultural consumption within tourism destinations. They provide a platform where visitors engage with local creativity through art, design, performance, and gastronomy. Such experiences transform tourists from passive spectators into active participants in cultural production (Wang and Kao, 2023). Festivals also serve as spaces for showcasing local talent and innovation, strengthening the destination's creative identity. Through this process, cultural and creative consumption fosters a deeper emotional connection between tourists and the host community, enhancing the overall cultural value of the destination (Cudny 2016; Thomasson, 2022).

2.3. Creative Industries

At the beginning of the twentieth century, culture became commodified on a mass scale, leading to its commercialization and the rise of mass culture. Due to the development of mass media - radio, television, and later the internet; increased societal wealth; and more leisure time, cultural products - both material and immaterial - became significant in social life. Subsequent decades saw culture's growing economic significance, influenced by the experience economy (Pine and Gilmore 2011) and the shift into a post-industrial phase (Rifkin 2000). Deindustrialization began in the 1950s, affecting many regions and cities. This process was accelerated by globalization, which shifted industrial production to Asia, replacing industrial activities with the growth of the service sector in Western countries (Wróbel 2017). Therefore, cultural services became a factor in urban and regional revitalization on different scales, partly replacing declining traditional industries (Bianchini 1993; García 2004; Jayne *et al.* 2010). This led to concepts like the cultural economy (Gibson and Kong 2005) and culture-led regeneration (Cudny 2016). Culture positively impacted spaces by generating employment, creating profits from cultural production, and promoting cultural and event tourism (Wang and Kao, 2023). Spatial revitalization was achieved through building cultural venues (*e.g.*, Guggenheim Museum in Bilbao), promoting localities based on cultural heritage, cultural production, and event sector.

The United Kingdom pioneered cultural industries which began playing a key role in development and revitalization policies in the late 1980s and early 1990s. This was a response to economic changes impacting traditional industries, leading to urban decline and unemployment (see Bennett *et al.* 2000). The Department for Culture, Media, and Sport (DCMS), established in 1997, played a crucial role in developing cultural industries. DCMS actively supported this sector through legislation, funding, and policy strategies. British authorities recognized the cultural and creative sector's potential as a catalyst for economic and social renewal, promoting a service- and culture-based economy (Lupu *et al.* 2025). Notable examples include the revitalization of London's East End. Similar initiatives occurred in Manchester, which, after the textile industry's collapse, focused on developing cultural industries (O'Connor 2007).

Later the concept of cultural industries evolved into creative industries due to the growing importance of technological innovations, and the knowledge-based economy. Initially focused on culture-related sectors to aid urban revitalization and counter deindustrialization, the concept expanded to include creative sectors. Therefore, the ideas of the creative economy and creative clusters, regions, and cities emerged (Środa-Murawska and Szymańska 2013; Lupu *et al.* 2025). In regions and cities, the creative economy leads to new jobs, attracts talent and investments, and fosters the revitalization of neglected areas (Graham 2005; Evans 2009; Landry 2012; Kalfas *et al.* 2024).

Creative industries were defined in the 1998 DCMS Mapping Document as industries that "have their origin in individual creativity, skill, and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property," encompassing sectors like advertising, architecture, arts and crafts, design, fashion, film, music, performing arts, publishing, software, television, and radio (Potts *et al.* 2012, p. 59). According to Turok (2003, p. 552), creative industries are "the area of overlap between cultural and commercial activities. They involve the supply of goods and services that contain a substantial element of artistic, imaginative, or intellectual effort, or that are associated with and play a vital role in sustaining cultural activities. The boundary is a matter of debate; for example, what forms of entertainment are included. They typically include film, television, video, music, the visual and performing arts, advertising, publishing, design activity, software and new digital media."

Richard Florida's creative class theory (2002) emphasizes the importance of creative professionals in driving the growth and innovation in creative industries and creative economy. According to Florida, cities and regions that attract and support the creative class foster socio-economic development. The creative class, consisting of scientists, engineers, and artists, is a key factor in global competitiveness. Although often criticized (see: Peck 2005; Cudny *et al.* 2020) Florida's concept further influenced urban development strategies, encouraging environments conducive to creativity, such as cultural zones, investments in education and research, and high-tech industries. Many urban regions began to emphasize technology, talent and tolerance (3Ts) as elements which attract the creative class and stimulate economic growth (Florida 2003). The emergence of innovation centres and first technology parks in cities like London, New York, and San Francisco became symbols of this change, attracting skilled workers and investors, fuelling dynamic economic and social development (Hospers 2003).

3. Festivals and Creative Industries: An Institutional Perspective

Attempts by institutions to define and recognize festivals within the creative industries are limited. According to the United Nations Conference on Trade and Development (UNCTAD) report (2008), festivals are classified as traditional cultural expressions (Table 1). However, this perspective offers a narrow view of festivals' value and their breadth within creative industries.

Festivals can be associated with other UNCTAD sub-groups of creative industries. For instance, in visual arts, festivals like the Mural Festival in Montreal, Canada, and the Berlin Mural Fest in Germany are examples. Photography festivals such as the FORMAT International Photography Festival in Derby, UK, and the Lagos Photo Festival in Nigeria exemplify this diversity. Festivals play a significant role in performing arts (live music, theatre, dance, etc.). Events like the Glastonbury Festival in Somerset, England, and Tomorrowland in Boom, Belgium, showcase the integration of festivals into this sector. Theatre festivals such as the Edinburgh Festival Fringe in Scotland or the Avignon Festival in France are illustrations. Cinema festivals like the Cannes Film Festival in France and the Berlin International Film Festival in Germany can be categorized within the audiovisual sector. Events like the Łódź Design Festival and Fashion Weeks represent the design sector, while the Festival of Comic Books and Games in Łódź represents new media.

To conclude, festivals span many creative sectors distinguished by UNCTAD, proving they are an integral part of the creative industries. Therefore, recognizing festivals solely within the traditional cultural expressions category is insufficient.

Table 1. UNCTAD’s classification of creative industries

	Sub-groups of creative industries according to UNCTAD
Creative industries	Traditional cultural expressions: arts and crafts, festivals and celebrations.
	Performing arts: live music, theatre, dance, opera, circus, etc.
	Audiovisuals: film, television, radio, and other broadcasting.
	New media: software, video games, digital creative content.
	Creative services: architecture, advertising, creative R&D, etc.
	Design: interior, graphic, fashion, jewellery, and toys.
	Publishing and printed media: books, press, and other publications.
	Visual arts: paintings, sculptures, photography, and antiques.
	Cultural sites: archaeological sites, museums, libraries, exhibitions, etc.

Source: Own elaboration based on http://unctad.org/es/Docs/ditc20082cer_en.pdf

The European Union document Unlocking the Potential of Cultural and Creative Industries (p. 14) highlights festivals' role in enhancing career opportunities and mobility for cultural workers who belong to the creative class, stating: "opening up new market opportunities and enhancing their career possibilities in particular through their participation in residencies, festivals, live touring performances, international exhibitions or literary events" (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/).

4. The Role of Festivals in Urban-Regional Growth within the Creative Industries: A Traditional Perspective

Several authors have acknowledged festivals as integral parts of the creative industries (Alvarez 2010; Rofe and Woosnam 2016; Cudny 2016; Richards 2016; Johansson and Toraldo 2017; Black *et al.* 2024; Islam and Sadhukhan 2025). Traditionally festivals are mostly recognized as platforms for presenting diverse art forms, including music (Matykowski and Zmudzińska 2022), film, theatre, visual arts such as graphics, paintings, and sculpture (Visser 2005), folklore (Bird 1983), heritage (Brennan-Horley *et al.* 2007; Kang *et al.* 2014; Cudny *et al.* 2022), fashion and design (Cudny and Rouba 2012), and new media like video games (Cudny 2016). By bringing these cultural products to audiences, festivals represent the creative industries and play a vital role in promoting cultural consumption (Snowball *et al.* 2010).

However, there is still limited focus on festivals as hubs of creative ideas and production. The participation of festival-goers is primarily seen as an opportunity to consume artistic creations and performances (Burgess 1992; Waterman 1998). As a result, cultural consumption becomes a pivotal element of cultural policies in cities hosting festivals. These policies develop urban economies through festival tourism and foster attractive place brands rooted in culture (Bianchini 1993; Richards and Wilson 2004; Quinn 2005; Degen and Garcia 2012; Zherdev 2014). Festival tourism is a clear example of cultural consumption, as it involves experiencing and engaging with the cultural expressions of a destination (Rivetti *et al.* 2024). Tourists participate in festivals to enjoy music, art, cuisine, and performances that reflect the traditions and creativity of local communities. Through these activities, visitors consume cultural products and experiences that hold symbolic, emotional, and aesthetic value. This process transforms culture into a form of economic and social exchange, where creativity and heritage become part of the tourism product. In this sense, festival tourism illustrates how culture is both produced and consumed within the broader context of the creative and experience economy (Wyatt and Rossetti, 2024).

Existing research also emphasizes the socio-cultural impacts of festivals, including fostering social capital, facilitating social interactions, and promoting cultural heritage (Small *et al.* 2005; Arcodia and Whitford 2007; Sharpley and Stone 2020). Moreover, participation in festivals represents a clear example of encounters between cultures - because festivals bring together people from diverse cultural, social, and geographical backgrounds. They create opportunities for the exchange of traditions, values, and artistic expressions through shared experiences such as music, performances, cuisine, and rituals (Hassanli *et al.* 2021). In this sense, festivals act as intercultural contact zones, where dialogue and understanding between different cultural groups can naturally emerge. These interactions often lead to cultural exchange and hybridization, inspiring new creative expressions and shared forms of identity. Thus, attending festivals extends beyond entertainment, serving as a significant form of intercultural communication and cultural co-creation (Cudny 2016).

Moreover, festivals are seen as vital in bolstering local and regional economies through tourism (Cudny 2013; Matykowski and Zmudzińska 2022; Akhundova, 2024), as attendees spend on accommodations, dining, and souvenirs, thereby stimulating local businesses. Festivals create jobs within the event, hospitality, and retail sectors. They also generate revenue from ticket sales, sponsorships, and vendor fees (Tohmo 2005; Saayman and Rossouw 2011; Hjalager and Kwiatkowski 2018; Ray, 2022; Kwiatkowski *et al.* 2024).

Furthermore, festivals as the whole creative industries sector are utilized in cultural-led development and regeneration strategies to rejuvenate cities experiencing stagnation (Cudny 2016; Finkel and Platt 2020). Festivals also enhance a destination's reputation, attracting investment in infrastructure and additional cultural events, thereby ensuring lasting benefits through cultural labeling (Johnson 2016; Cohendet *et al.* 2010; Landry 2012; Cudny *et al.* 2020).

For example, Edinburgh, has developed its economy and brand through festivals like the Edinburgh Festival Fringe, attracting millions of visitors annually and significantly boosting its tourism industry and economy. The festivals held in Edinburgh are a tourism asset of global significance, attracting visitors from all over the world and shaping the city's international image (Thomasson, 2022). Events such as the Edinburgh International Festival and the Fringe have made the city one of the leading cultural capitals of Europe. On this basis, the city has developed long-term urban and regional development strategies that integrate culture and tourism as key drivers of growth. Festival tourism has become central to the city's economic and branding policies, supporting local businesses, creative industries, and year-round visitor engagement. As a result, Edinburgh's festivals not only enhance its global visibility but also serve as a model for sustainable cultural and tourism-based development (see: https://www.visitscotland.com/things-to-do/events/edinburgh-festivals).

In 2008, Liverpool and Stavanger were named European Capitals of Culture. Liverpool, once a major industrial hub, leveraged this designation to revitalize its image and boost its economy through a year-long series of celebratory events (West 2022). Similarly, Wrocław, as the European Capital of Culture in 2016, organized numerous cultural events that fostered the city's development by improving infrastructure, increasing tourism, enhancing its international profile, and stimulating economic growth.

In conclusion, in a classic academic view festivals are recognized as integral components of the creative industries; however, they are predominantly perceived as events focused on the consumption of creative goods. They are also viewed as tools for economic growth and urban development through consumption. This perspective is an instrumental approach, treating festivals as tools to stimulate growth and brand creation. Insufficient attention is given to considering festivals as hubs of creativity, nurturing the creative class and fostering creative ideas.

5. A Deeper Understanding of the Connection Between Festivals and the Creative Industries

5.1. Festivals as Creative Productions

Festivals are cultural creations, even when they feature pre-existing artistic works. They present performing arts through live performances, using mediums such as drama, dance, and music to convey creativity and engage audiences. Organizing a festival involves numerous creative decisions, including curating unique programs, selecting artists, and staging music or theatre performances. Some festivals also incorporate real-time art creation, such as the International Ice and Snow Sculpture Festival in Harbin, China. As a result, the festival process itself represents a distinctive form of cultural creation (Turok 2003; Larson 2009, 2011; Wang and Kao, 2023).

Waterman (1998) emphasized that festivals serve not only as venues for cultural consumption but also as sites of cultural production. This dual role is crucial, especially since creative production is often regarded as more significant than consumption in the development of creative cities (Comunian 2011). As such, staging a festival can be considered a form of creative production, built on extraordinary experiences and integrally linked to creative city policies. Festivals, as innovative cultural products, frequently operate within local and international networks of creative individuals and entrepreneurs. They generate creative outputs based on diverse domains, including knowledge (*e.g.*, scientific festivals), culture (*e.g.*, film or music festivals), new media, and entertainment (*e.g.*, gaming festivals). To attract repeat visitors, festivals must continually innovate, offering fresh experiences with each iteration. Thus, creativity is an indispensable element of festival execution (Larson 2009; Ossowska *et al.* 2024).

Moreover, festivals embody a dynamic creative chain, integrating the expertise of professionals such as artists, managers, and technicians in a collaborative process. Artists deliver emotive performances, managers curate holistic experiences, and technicians apply their specialized skills. This synergy shapes the unique identity of each festival, advances innovation, fosters community engagement, and enriches the broader discourse on creative industries and cultural production (de Valck 2007; Jordan, 2016).

5.2. Festivals as Part of Creative Networks

Festivals contribute to the development of creative social networks (Larson 2009; Gibson *et al.* 2010). Social networks were first discussed by John Arundel Barnes. The concept gained popularity in the late 20th century among anthropologists and sociologists, later extending to political science, economics, and computer science. It is linked to Talcott Parsons' theory of social systems, which views a social system as a network of interactions among actors at various levels (family, friends, work). Social networks encompass interactions from local to global scales (Mitchell 1974).

Social network theory includes concepts focusing on individuals, teams, organizations, and their interpersonal relationships that constrain and enable human actions. Social network analysis examines the participants, their relationships, and how these relationships form a framework (Galaskiewicz and Wasserman 1994). A network consists of nodes and ties. In social networks, nodes can represent actors like government agencies or non-actor entities such as collaboration venues and events. Ties represent relationships like information exchange, trading, disagreements, or joint participation (Bodin *et al.* 2020).

In the creative arts, networks play a pivotal role in connecting artists, agents, and audiences. Events like festivals are crucial for fostering these social networks by bringing together various stakeholders (Jarman *et al.* 2014; Jordan, 2016, Braden and Teekens 2019; Grau Pérez, 2025). According to Comunian (2017a), networks are vital in creative fields such as the film industry. De Valck (2007) identifies "obligatory points of passage" as key nodes within these networks, with festivals exemplifying such points.

Film festivals for example enable industry members to meet, exchange ideas, and collaborate on projects. They provide filmmakers with opportunities to present their work to audiences and connect with professionals such as actors, producers, directors, and screenwriters, facilitating partnerships. As network nodes, film festivals support the development, showcasing, distribution, and innovation within the film industry. Consequently, as part of the creative industries (Cunningham 2002; Turok 2003; Comunian 2017a), film festivals are indispensable nodes within creative industry networks (de Valck 2007; Cudny and Ogórek 2014).

Furthermore, festivals are vital in forming creative social networks across geographical scales. Locally, they serve as hubs where artists, producers, and audiences converge, facilitating idea exchange, collaborations, and showcasing talent. This strengthens community ties, fosters a supportive creative environment, and offers local artists opportunities to develop the cultural scene. Globally, festivals connect artists and producers from different regions, promoting cultural exchange and mobility. By attracting international participants and audiences, festivals expand local artists' reach, highlight global trends, and enable cross-border collaborations (Cudny *et al.* 2020; Quinn, 2025).

For instance, the Camerimage Film Festival, currently held annually in Toruń, Poland, is a premier event dedicated to cinematography and serves as a node in creative film network (Cudny and Ogórek 2014). During this event, attendees make valuable industry contacts, participate in workshops, and collaborate on future projects - often developing cooperation plans - thereby strengthening the global creative network of filmmakers (https://camerimage.pl/en/energacamerimage).

5.3. Festivals as Temporary Creative Clusters

The next concept explaining the role of festivals in the creative industries is cluster theory. Clusters in regional development are geographic concentrations of interconnected businesses, suppliers, and associated institutions in a specific field. These clusters often include collaborating and competing firms, specialized suppliers, service providers, and institutions such as universities and trade associations (see: Roberts and Lowe, 2024). According to Porter (1990), clusters can impact competition in three ways: by increasing company productivity, driving innovation, and stimulating new businesses in the field.

The role of creative clusters in urban and regional development has been widely studied (Bagwell 2008; Evans 2009; Chapain and Sagot-Duvauroux 2020; Gutierrez-Posada *et al.* 2023). Clusters serve as nodes for the spatial concentration of innovation, business creativity, and modern technologies through cooperation and experience exchange. Related to events is the concept of temporary clusters, which refer to gatherings such as conferences, congresses, trade fairs and festivals (Maskell *et al.* 2006).

Festivals function as temporary clusters of creativity, transforming their host destinations into vibrant hubs for knowledge exchange, networking, culture and idea generation. They act as focal points for showcasing talent and fostering connections, creating dynamic spaces where all aspects of the festival's creative content converge. Despite their temporary nature, festivals often have a year-round impact, with venues housing organizers who curate programs and recruit participants well in advance, sustaining creative activity beyond the event itself (Cudny 2016).

Many festivals also maintain functional and spatial ties with contractors and event-related institutions such as art foundations, incubators, universities, film schools, or recording studios. These relationships form broader creative clusters that integrate festival venues, events, and associated organizations, fostering innovation and collaboration. For example, the International Festival of Music Producers and Sound Designers Soundedit in Łódź connects creative music producers, offering opportunities for cooperation, education, and workshops. Hosted at TOYA Studios, a music and dubbing production firm, the festival exemplifies how partnerships enhance both event execution and the creative ecosystem (https://soundedit.pl/en/).

Festivals vary in geographic scale, operating within global networks while embedding themselves in local connections among creative institutions, practitioners, and infrastructure (Gibson *et al.* 2010; Comunian 2011). Comunian (2017b) highlights that many festivals function as temporary creative clusters, profoundly influencing regional and local economies. The participation of the local creative class and entrepreneurs is critical, as they co-organize events, collaborate on projects, and drive the development of the creative economy (Cohendet *et al.*

2010). Festivals provide access to global knowledge, enabling local creatives to understand trends and harness their potential to produce and commercialize experience-based products (see Kwiatkowski *et al.* 2024).

In Łódź, Poland, the local creative class plays a pivotal role in festivals such as the Łódź Design Festival and Fotofestival. Supported by the Łódź Art Incubator – Creative Industries Incubator, they curate exhibitions, organize workshops, and host lectures that showcase both emerging and established talent in design and photography. This active participation enriches the festivals' quality and diversity, fosters artistic growth, and facilitates networking and cultural exchange. Strengthened by the support of the Łódź Art Incubator, these festivals position Łódź as a vibrant cultural hub, attracting visitors and participants from around the world (see Cudny 2016; Cudny *et al.* 2020).

5.4. Festivals as Creative Business Developments

Festivals play a pivotal role in fostering creative entrepreneurial collaboration, acting as hubs for business connections within the creative sector. These connections inspire new solutions, facilitate the introduction of innovative products to the market, secure funding, and link creative entrepreneurs with both business clients and individual customers. By showcasing creative products and entrepreneurship, festivals enable individual buyers or wholesalers to discover and purchase items at events (Gibson *et al.* 2010; Qu and Zollet, 2023).

Festivals strengthen Business-to-Customer (B2C) relationships by offering opportunities for direct sales and engagement with buyers (see: Fernandes and Krolikowska 2023). For instance, fashion or design festivals showcasing everyday products like furniture, as well as art festivals featuring music, graphics, or sculpture, allow artists and designers to display, brand and sell their creations during or after the event. This exposure not only promotes creative firms but also helps them attract new customers.

In addition to fostering B2C connections, festivals also facilitate Business-to-Business (B2B) interactions by bringing together entrepreneurs, including startups. Events such as film, design, fashion, and computer game festivals provide opportunities for partnerships with firms, sponsors, agents, and retailers. For instance, Fashion Weeks serve as vital platforms for business development, enabling designers to connect with buyers and industry professionals while gaining media exposure that extends their reach to global retailers (Cudny and Rouba 2012; Duignan *et al.* 2018).

As discussed, festivals play a crucial role in creative industries by supporting the development of creative enterprises and fostering the growth of the creative class through their facilitation of B2B and B2C interactions. These events not only drive economic growth but also strengthen the creative sector's influence on urban and regional economies.

5.5. Festivals as Hubs for Education, Social Justice, and Creative Atmosphere

Festivals play a pivotal role in education, serving as vital components of the modern learning paradigm that fosters innovation in society. High-level education is essential for nurturing creativity, especially among youth. Enhancing educational opportunities boosts creativity, which in turn improves problem-solving abilities, fosters ingenuity, social equality and justice, elevates quality of life, and stimulates productivity and economic growth (Shaheen, 2010; Sendra, 2024).

As powerful educational tools, festivals immerse attendees in diverse cultural, scientific, and artistic experiences (Kridel, 1980; Childs, 2017). Cultural festivals like the Edinburgh Festival Fringe showcase a wide range of artistic expressions, allowing attendees to explore various cultural narratives and traditions, thereby enriching their cultural capital. Similarly, the Venice Biennale, one of the most prestigious cultural festivals held in Italy, educates the public about contemporary art by introducing new artistic movements and ideas.

Science festivals offer interactive workshops, lectures, and demonstrations that make complex scientific concepts accessible to the public (Park *et al.* 2019). Events such as the World Science Festival in New York City and the Cambridge Science Festival bring together leading scientists, artists, and thinkers to discuss and display scientific advancements, promoting lifelong learning and curiosity.

Music festivals and events, including those featuring popular music, often incorporate educational workshops on music history, instrument making, and songwriting, providing attendees with a deeper understanding of music and its cultural significance (Snell, 2005). Additionally, festivals like the Smithsonian Folklife Festival in Washington, D.C., focus on cultural heritage, featuring live demonstrations and performances that educate visitors about diverse cultures, traditional crafts, music, and customs from around the world. Film festivals, such as the Sundance Film Festival and Camerimage, not only screen films but also host panels and discussions with filmmakers, offering insights into the filmmaking process (Cudny and Ogórek, 2014).

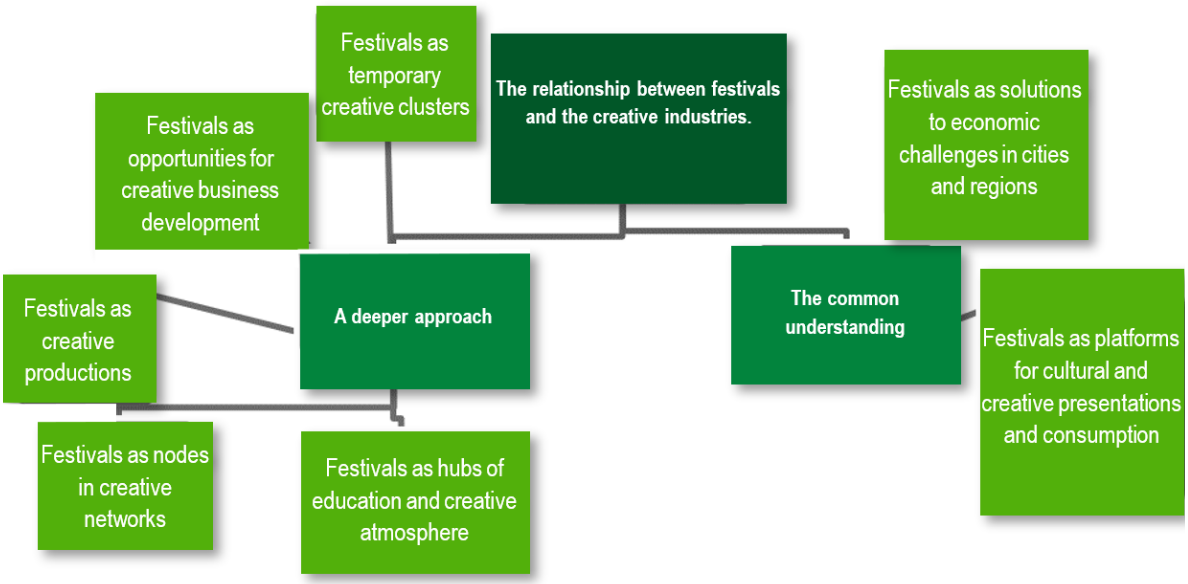
The concentration of the creative class in specific locations is facilitated by Richard Florida's "3T" factors: Technology, Talent, and Tolerance (Snowball *et al.* 2010). Festivals help fight social prejudices and create a tolerant, open, and multicultural atmosphere (Walters *et al.* 2021). Events such as LGBTQ+ gatherings, like San Francisco Pride or Sydney Gay and Lesbian Mardi Gras create spaces for free sexual expression (Waitt 2008), while multicultural festivals showcase diverse racial and ethnic backgrounds, fostering a tolerant environment (Johnston and Waitt, 2015; Duffy, 2005; Buch *et al.* 2011; Lee *et al.* 2012; Hassanli *et al.* 2021; Son and Krolikowski 2025). Organizing these festivals requires creativity in developing diverse programs, selecting a range of artists, and designing unique events that celebrate cultural expression. For instance, The Pasifika Festival in Auckland unites multiethnic societies, reduces cultural tensions, and builds social capital in diverse communities. It facilitates interaction and integration between dominant ethnic groups and recent immigrant minorities, combating intolerance, racism, and prejudices (Cudny and Maiava, 2016).

According to Waitt (2008), festivals are often established in cities aiming to reinvent themselves as vibrant, dynamic, and cosmopolitan. Florida (2005) notes that the creative class gravitates towards places with dense labor markets, openness, tolerance, justice and a high quality of life. Tolerance regarding sexual orientation, ethnicity, and race is particularly important in attracting creative individuals who value freedom and diverse lifestyles, including skilled immigrants (Florida *et al.* 2008). These individuals, often referred to as bohemians, embrace unconventional lifestyles and seek engaging leisure opportunities (Comunian *et al.* 2010). Festivals and events fulfil multiple roles by creating vibrant atmospheres akin to bohemian culture and showcasing various cultural expressions. They provide stimulating leisure activities that attract culturally inclined individuals, offering dynamic and exciting environments for leisure time (Cudny, 2016; Van der Hoeven and Hitters 2023).

Conclusion and Further Research

This article bridges a research gap by synthesizing traditional perspectives on festivals and their intrinsic ties to the creative industries, positioning the festival sector as a cornerstone of this ecosystem. The concept of the relationship between festivals and creative industries presented in the article may serve as a basis for future case study research and broader analyses of the interconnections between festivals and creative industries. The presented analysis establishes a framework for understanding the dependencies between these elements in terms of a common understanding of these relationships and a deeper comprehension of them (Figure 1).

Figure 1. The relationship between festivals and creative industries - a framework



Source: Author's elaboration.

By examining key intersections, the study highlights festivals as platforms for cultural and creative consumption, showcasing diverse art forms (Visser, 2005), folklore (Bird, 1983), heritage (Brennan-Horley *et al.* 2007; Kang *et al.* 2014), fashion, design (Cudny and Rouba, 2012), and new media (Cudny, 2016). In classic view these events facilitate the consumption of cultural and creative products, encapsulating the essence of the creative industries. The traditional roles of festivals are very often realized within festival tourism, which is a branch of cultural tourism. In this context, festivals serve as both tourist attractions and tourism products that enrich the cultural offer of destinations (Matykowski and Zmudzińska 2022; Thomasson, 2022; Akhundova, 2024). They provide visitors with opportunities to engage in cultural consumption, experiencing local creativity, heritage, and traditions in diverse and dynamic ways. In doing so, festivals expand the scope of cultural experiences available to tourists and enhance the overall attractiveness of a destination (Ray, 2022; Kwiatkowski *et al.* 2024) (Figure 1).

Festivals play a crucial role in shaping socio-cultural and economic dynamics within the creative economy. They nurture social capital, foster creative interactions, and preserve cultural heritage (Small *et al.* 2005; Arcodia and Whitford, 2007; Sharpley and Stone, 2020). Economically, festivals stimulate tourism, boost local employment, and contribute to regional development and place branding (Tohmo, 2005; Saayman and Rossouw, 2011; Cudny 2022), aligning with the broader goals of the creative industries (Figure 1).

A deeper analysis reveals festivals as drivers of creative production, networking, innovation, and education (Figure 1). Festivals transcend passive consumption by actively producing cultural content, such as live art and performances, fostering unique interactions between attendees and creators (Wang and Kao, 2023). These experiences often reflect the host locale's creative identity (Turok, 2003; Larson, 2009, 2011).

Festivals are pivotal for building creative social networks (Larson, 2009; Gibson *et al.* 2010; Jarman *et al.* 2014; Jordan, 2016, Braden and Teekens 2019; Grau Pérez, 2025), acting as hubs for interaction among artists, institutions, and venues. These networks enhance collaboration and innovation, strengthening the creative industries ecosystem (Bodin *et al.* 2020) (Figure 1). For example, film festivals serve as "obligatory points of passage," facilitating professional connections and partnerships (de Valck, 2007; Cudny and Ogórek, 2014).

As temporary creative clusters, festivals resemble regional economic clusters by bringing together businesses, suppliers, and institutions to foster cultural vibrancy and growth (Porter, 1990; Comunian, 2017b). Their regional influence often includes collaborations with firms, artistic studios, universities, and other locally based organizations (Figure 1).

Festivals also catalyze entrepreneurship, offering creators market exposure, fostering innovation, enabling product launches, and securing funding (Fernandes and Krolikowska 2023; Qu and Zollet, 2023). Design, fashion, and film festivals connect creators with industry professionals and consumers, underscoring their importance in the creative industries (Gibson *et al.* 2010; Duignan *et al.* 2018) (Figure 1).

Educationally, festivals provide immersive learning experiences that enhance cultural, artistic, and scientific knowledge (Kridel, 1980; Childs, 2017). Interactive workshops and showcases offer accessible opportunities for public engagement (Park *et al.* 2019; Cudny and Ogórek, 2014). Additionally, they educate on social justice and combat stereotypes, supporting underrepresented groups (Walters *et al.* 2021).

Festivals also attract and support the creative class, driven by Richard Florida's "3T" factors - Technology, Talent, and Tolerance (Snowball *et al.* 2010). Events like LGBTQ+ festivals advocate for equality, while multicultural festivals celebrate diversity, fostering inclusive, dynamic communities (Waitt, 2008; Hassanli *et al.* 2021; Son and Krolikowski 2025). These contributions enhance cities' appeal and cultural vibrancy (Figure 1).

While this study offers meaningful insights into how festivals connect with the creative industries, there are some important limitations to consider. The conceptual research is primarily based on a review of existing literature, online sources and personal reflections through autoethnography. These methods help build a broad and conceptually rich picture, but they lack direct, real-world testing. To better understand how these ideas play out in practice, future research should include detailed case studies or fieldwork involving actual festivals, along with their organizers, participants, and local communities.

The autoethnographic elements - commonly used in qualitative research - are drawn from the author's own experiences and observations at festivals. These reflections provide valuable, first-hand insights, but they are inherently subjective and may not fully represent the diversity of festival experiences across different cultural or geographic contexts.

Future studies would benefit from combining the conceptual approach with more empirical research to build a more comprehensive and grounded understanding of the role festivals play in the creative industries.

Credit Authorship Contribution Statement

Waldemar Cudny: Conceptualization, Methodology, Investigation, Formal analysis, Project administration, Writing –review and editing, Visualization.

Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The author declares that AI-assisted technologies were used during the writing process prior to submission. These tools were employed to enhance the clarity, language, and readability of the manuscript, and their use has been fully disclosed in accordance with publication guidelines.

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AI-Driven Creativity: The Role of Generative Models in Event Theme and Design Conceptualization

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Abstract: This study examines how generative AI influences creativity in event theme development and design conceptualization. It explores how AI affects ideation, originality, efficiency, and ethical decision-making within event management.

An integrative review of academic and industry literature from 2021–2025 was conducted across event design, creative industries, and AI research. A qualitative thematic analysis synthesised insights on generative models, human - AI co-creation, and design workflows, forming the basis for a conceptual framework.

Results indicate that generative AI accelerates ideation, visualization, and early-stage prototyping, allowing designers to explore a wider range of creative directions in less time. Human - AI collaboration enhances creativity but may also narrow stylistic diversity when prompts or datasets lack cultural depth. Ethical challenges persist around authorship attribution, data provenance, and cultural bias. The study emphasizes that AI is most effective when positioned as a co-creator that complements human intuition and contextual judgement.

This study is among the first to focus specifically on generative AI within event design. It offers a conceptual model of human - AI co-creation and identifies professional, educational, and regulatory implications for integrating AI into creative workflows.

The study is based on secondary data; future empirical research is needed to validate the proposed framework.

Keywords: generative AI; event design; human - AI collaboration; creativity; ethics; event management

JEL Clasiffication: D47; O32; Z33.

1. Introduction

1.1 Background and Rationale

Artificial Intelligence has undergone its transformation from the backstage assist to an apparent creative partner across the industries. The nature of GenAI is now affecting the conceptualization of event themes and visual identities in the event management industry, where immersive designs, narratives, and emotional resonance define audience engagement. Traditionally, event design relied on human intuition, manual sketching, and iterative brainstorming. But now, with the diffusion- and transformer-based models, designers are able to produce on-the-fly visual prototypes incorporating data-driven insight with their creative exploration (Croitoru *et al.* 2023; Yang *et al.* 2022).

Within mere seconds, Midjourney and DALL·E, Runway, and Stable Diffusion provide concept variations, which lend visual varieties and ideation efficiency that had previously been unthinkable. In effect, these advances have shifted designers' roles, requiring them to act as prompt engineers who guide AI tools toward client expectations. With the industry gradually choosing digital workflows in the post-COVID world (Keiper, 2023), the need to assess how AI-based creativity influences event theme and design conceptualization was at the center of this study.

This study argues that AI advances are transforming event design from a purely technical process to a cultural–creative one. Generative AI raises new questions about authorship, originality, and creative autonomy (Bender, 2024; Erickson, 2024). Considered from an event-management perspective, such shifts indicate that the designer might cease to be an independent creator, becoming rather one among a number of co-creators with algorithms.

1.2 Evolution of Creativity in Event Design

Creativity in event design has continuously evolved in response to changing cultural, aesthetic, and technological influences. Earlier, creative processes depended largely on human imagination, sketching, and manual concept development. With the introduction of digital rendering and visualization tools in the 2000s, designers began integrating technology to experiment with layouts, lighting, and thematic compositions more efficiently. Generative AI represents the latest stage in this evolution. Rather than simply automating tasks, it acts as a creative collaborator by translating text prompts into visual metaphors, thematic compositions, and aesthetic variations. This shift reflects a broader transition from purely human-led creativity to hybrid human - AI co-creation, where designers combine their intuition with algorithmic generation to develop immersive and culturally relevant event experiences.

1.3 Emergence of Generative AI in Creative Industries

Across the wider creative industries - such as advertising, gaming, media production, and digital art - generative AI has rapidly become a core tool for visual ideation. Studies show that human - AI collaboration enhances productivity and expands the range of creative possibilities through faster iteration cycles and diverse aesthetic outputs (Holzner *et al.* 2025; Doshi *et al.* 2024). In event design specifically, generative models are now used for moodboards, stage layouts, thematic storyboards, décor simulations, and brand-inspired concept variations. However, their growing adoption also introduces challenges, including intellectual property ambiguity, data-provenance concerns, and the risk of homogenized creative outputs when AI-generated visuals are applied without human interpretation. These concerns highlight the need to treat AI not merely as a tool, but as a participant within a responsible, culturally aware design process where human intention and ethical judgment remain central (Haase & Pokutta, 2024).

1.4 Significance of AI in Event Management and Thematic Innovation

Event design values emotional impact and originality. Generative AI supports these goals by combining analytical insights with aesthetic intuition. By incorporating elements such as brand personality, cultural motifs, and sustainability themes, AI-generated visuals help create event concepts that resonate strongly with audiences. Keiper (2023) maintained that in integrating ChatGPT and image-generation systems with event-planning workflows not only heightens efficiency but also fosters further creative experimentation. In the planning stage, creative processes powered by AI allow event professionals to test multiple creative directions, generate dynamic moodboards, and simulate audience experiences prior to any actual execution. It allows them to cut down costs while speeding up approval cycles and stakeholder engagement. Yet according to such authors as Bender (2024) and Erickson (2024), if AI invades creative labor, the lines of authorship can be blurred, creativity is made commodified. Hence, a responsible use of generative AI will require transparency, ethical design practices, and human oversight to ensure that event storytelling retains authenticity.

1.5 Scope, Methodology, and Limitations

This study selects qualitative, secondary-data-based research design. The data were collected from peer-reviewed journals (2021–2025), white papers of industry, and scholarly reviews on AI in creativity, design, and event management. This research synthesizes conceptual insights joined with recent case discussions to map the role of generative AI in conceptualizing event themes and design. There is no primary data collection for this paper, rather this paper attempts interpretive insight by comparing and synthesizing literature. One of the limitations is that AI evolves so rapidly that some tools or models currently impeded may all cease to exist within the span of a few months. Another limitation is the interpretive nature of research-based creativity. Nonetheless, the study offers a conceptual basis for the comprehension of AI-driven creativity in the event sector and covers several areas for integration of an ethical nature, allied professional development, and curricular promotion.

1.6 Research Objectives

This study investigates the use of generative AI methods to foster creativity in event theme and design conceptualization. The first objective is to search for patterns into the impact of generative AI on the creative processes in event design; more precisely, into the interaction between humans and AI for ideation, visualization, and thematic creativity.

The second objective seeks to further explore the advantages generated AI software can produce to innovation, efficiency, and aesthetic virtues and whether the tools promote artistic innovation or risk becoming a kind of aesthetic uniformity in event design practices.

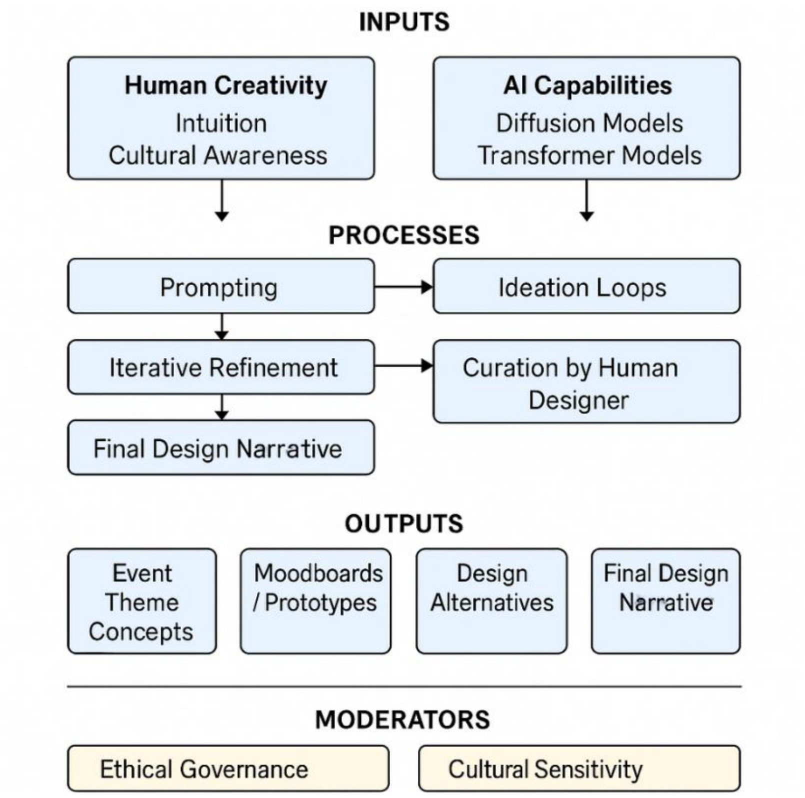
The third objective concerns the assessment of the implications and opportunities occasioned by the integration of generative AI in professional event design workflows, including ethical concerns and authorship issues, as well as the management of creativity. These objectives shape the literature review, which explores the evolving relationship between human creativity and AI-assisted creativity in event design.

1.7 Research Gap and Contribution

Although generative AI has been widely studied in creative industries, little research examines its role specifically in event theme development and design conceptualization. Existing work focuses on general creativity, media production, or design education, but does not provide an event-focused understanding of how diffusion and transformer models influence ideation, visualization, or thematic storytelling. There is also a lack of clear conceptual frameworks describing how human designers and AI systems interact during the early creative stages of event design. As a result, the event sector lacks a structured perspective on how AI affects originality, aesthetic direction, and ethical decision-making.

This study addresses these gaps by offering an integrated synthesis of literature from AI, design research, creative studies, and event management to explain how generative models reshape creative workflows in event design. It proposes a conceptual model of human–AI co-creation that clarifies the relationship between human intuition, computational generation, and designer-led curation. The study also highlights event-specific opportunities, risks, and ethical considerations, including issues of authorship, bias, and cultural sensitivity. By doing so, it provides a foundational conceptual base for future empirical research on AI-assisted creativity in event design.

Figure 1. Conceptual Framework for Human–AI Co-Creation in Event Design



2. Literature Review

2.1 Technical Foundations of Generative AI Relevant to Event Design

Recent studies highlight major advances in image and multimodal generation. Diffusion models and transformer-based pipelines now offer higher fidelity and greater control compared to earlier GAN approaches, enabling faster and more accurate visual ideation (Croitoru *et al.* 2023; Yang *et al.* 2022). For event designers, this means they can quickly generate moodboards, scenic concepts, wayfinding motifs, and color palettes. These outputs can then be refined through multiple iterations to meet tight client timelines.

2.2 Human-AI Co-creativity: what Improves, what Converges

According to existing evidence, human creativity improves with GenAI assistance, though overly strong AI direction can limit the range of ideas. According to the 2025 meta-analysis across 28 studies, there is no significant difference between AI-only and human-only outputs, while collaboration between human and AI improved creativity (g = 0.27) but decreased diversity (g = -0.86) (Holzner *et al.* 2025). Experiments in Science Advances conversely showed that AI ideas might raise perceived creativity and writing quality but might converge to avoid divergence (Doshi *et al.* 2024). These findings imply that event teams should mix AI-generated ideas with methods promoting divergence, such as alternate prompting, counter-briefs, or human curation checkpoints (Holzner *et al.* 2025; Doshi *et al.* 2024).

2.3 AI in Design Workflows: Early-Phase Amplification, Late-Phase Curation

Across all design disciplines, GenAI is most helpful in early ideation phases, generating many viable variants in a short time, whereas humans remain responsible for evaluation, integration, and narrative coherence (e.g., brand fit, cultural nuance, site constraints). Human–AI co-creation paradigms stress transparent controls and role clarity (AI as assistant/co-creator) and consider interfaces exposing parameters so designers can steer rather than passively accept outputs (Haase & Pokutta, 2024; Wang, 2025). This is consistent with the event theming pipeline, by which prompts serve breadth generation and experts culminate toward a coherent experience grammar (Haase & Pokutta, 2024; Wang, 2025).

2.4 Evidence from Event Management and Hospitality Education

Direct research into the event sector is emerging. Keiper (2023) observes that ChatGPT speeds various planning tasks-from briefing, run-downs, and vendor communications-to simulating event workflows in the classroom and asserts critical review and prompt literacy should be core competencies. Sector literature and practice notes propose use cases in content ideation, schedule generation, audience Q&A, and hybrid staging, while warning against over-automation and loss of "human touch" in experiential design (Keiper, 2023: also see applied notes in practitioner outlets).

2.5 AI-driven Experiences in Cultural & Creative Industries (CCIs)

In their study, Gürel (2025) show GenAI reshapes supply chains of content, interactive storytelling, and real-time adaptation to audience signals. Such kinds of insights can be applied to event theming: AI aided in mapping brand values to visual metaphors, iterated scenography for different audience segments, and simulated atmospheres for alternative decisions (e.g., eco-centric galas versus tech futurism summits) before build-out.

2.6 Ethics, Legality, and Governance for AI-Generated Design

The ethical literature records recurring issues concerning training-data provenance and storage, copyright and fair use, bias, privacy, and the displacement of human labor (see, e.g., Osborne *et al.* 2022; Santoso *et al.* 2022; Chesher and Hepworth, 2024). An interdisciplinary review, however, suggests solutions that scholars can use themselves to fight against these concerns: transparency and licensing of the dataset, watermarking and attribution of the outputs, and governance by design (Al-kfairy *et al.* 2024). Policy analysis in the U. S. and EU highlights also the still-unresolved legal questions about trainability on copyrighted works and the copyrightability of outputs produced by AI-a question of utmost importance for agencies pitching AI-assisted ideas to clients (U. S. Copyright Office, 2025; European Parliament, 2025). The implications for event design would hence be: disclosure, scoped licensing, and internal QA for bias/cultural sensitivity (Al-Kafiry *et al.* 2024; U. S. Copyright Office, 2025; European Parliament, 2025).

2.7 Sector-Adjacent Insights from Tourism & Experience Management

Recent reviews examined how AI is used in tourism - from personalization to logistics and risk analysis - but noted that little work addresses its aesthetic or thematic aspects, which motivates this study (López-Naranjo *et al.* 2025). This implies an under-theorized and poorly documented prescribing potential of AI intervention in the creative front-end of events, including theme ideation, visual storytelling, and spatial moods, thus marking the need for a targeted synthesis on generative models for design conceptualization. (López-Naranjo *et al.* 2025).

3. Research Methodology

3.1 Research Design

The research is framed as qualitative, exploratory, and descriptive. It, in any case, rests primarily on secondary data. This approach provides a comprehensive understanding of theoretical and experiential developments in creativity and technology, especially as generative AI continues to evolve in event design. The investigation as opposed to testing hypotheses centers on compiling or presenting an interpretation of relevant literature with the aim of discerning the thematic landscape, salient opportunities, and challenges with AI facilitated creativity. A literature-based approach (Snyder, 2019) seems most fitting for an attempt at knowledge consolidation in a fast-changing field.

Achieving this goal is the objective of this study through the integrative literature review approach, which involves conducting conceptual analysis, thematic synthesis, and comparative evaluation. At a more theoretical perspective, integrative reviews suit topics that are emerging in multi-domains such as this, since they weave results from various disciplines into a common conceptual framework (Whittemore & Knafl, 2005). Thus, the methodology consists of four interpretivist analyses: locating material, screening based on inclusion criteria, organizing the literature thematically, and synthesizing insights to disassemble the conceptual linkages among AI, creativity, and event design.

3.2 Data Sources

The investigation depends completely on secondary sources, chosen between 2021 and 2025 from academic and industry writings. They included event management, hospitality, design, and computer science peer-reviewed journals, credible industry white papers, policy reports, and conceptual reviews of the related issues. The main academic literature was accessed by means of credible databases such as Scopus, Web of Science, ScienceDirect, and Google Scholar.

The study of AI-assisted services for event planning was conducted by Keiper (2023), while Wang (2025) evaluated Human-AI co-creation in design, and Holzner *et al.* (2025) studied generative AI and its implications upon creativity. Technical surveys are also available on diffusion models (Croitoru *et al.* 2023) and on ethical frameworks related to AI in creative contexts (Bender, 2024; Guzman & Lewis, 2024; U. S. Copyright Office, 2025). Only sources with verified DOIs or official institutional links were included to ensure reliability.

3.3 Inclusion/Exclusion Criteria

The data collection process followed a set of established inclusion/exclusion criteria in order to maintain relevance and quality of the work. Publications were included if they were peer-reviewed, published between 2021 and 2025, and lay in domains such as generative AI, creative design, human-AI collaboration, or event management. Studies that explicitly dealt with the study of creativity, modeling of technological mediation, and processes of design in professional or educational settings were selected.

On the other hand, sources that did not have a verifiable author or DOI, or, if they exclusively dealt with automation, robotics, or predictive analytics without any reference to creativity or design, were excluded. Non-academic material such as blogs and opinion pieces was also discarded. After this initial screening, thirty-eight peer-reviewed studies and seven conceptual reports were offered as the core data set for this research.

3.4 Analysis Approach

The literature has been subjected to a qualitative thematic analysis based on the framework by Braun and Clarke (2019). Thereafter, all documents were read with care, and repetition of certain ideas was coded into themes such as AI and creative ideation, human-AI co-creativity, transforming design workflows, ethical considerations, and event and experience industries applications. These themes helped in the cross-disciplinary synthesis from where patterns relevant to event themes and design conceptualization could be identified.

The emphasis in the thematic process was on interpretive depth and away from statistical generalization; this allowed for constructing conceptual linkages among the creative and event industries. The qualitative synthesis links ideas from AI, hospitality, and design research to explain how generative systems shape creativity in event contexts.

3.5 Validation and Reliability

The reliability of research findings was assured using several validation methods. Triangulation was performed within different academic disciplines of AI technology, creative design, and event management to assess whether the results were consistent. To verify the integrity of the citations and DOIs and ensure traceability, the veracity of such references was cross-checked along multiple scholarly databases. Inclusiveness was maintained by including both the rosy view that sees innovation and efficiency (Keiper, 2023; Wang, 2025) and the objectionist view that emphasizes labor and ethical issues (Bender, 2024; Erickson, 2024), thus reducing the risk of bias. Other opinions on design were analyzed in detail; stepwise approach. The many ways of triangulation coupled with reflexivity make the analysis process transparent and credible.

3.6 Limitations of the Methodology

Since this study draws only on secondary data, it is thus limited by the reach and depth of the existing literature. The fast pace with which generative AI technologies sprout is another major impediment to study, as any tool or technique can become outdated in no time. More so, since much of the literature reviewed is conceptual, practically applicable insights based on event design workflows may yet remain underdeveloped.

The qualitative and the interpretive nature of the study makes it ripe for some sort of bias to creep into thematic categorization. However, these limitations are counterbalanced by the broad interdisciplinary scope of this study, meticulous source verification, and balanced analysis. Even with these limitations, the selected methodology serves as a solid conceptual foundation for giving us an understanding of how generative AI can affect creativity, efficiency, and ethical decision-making in the development of event themes and designs.

4. Results and Analysis

4.1 Generative AI and the Creative Process in Event Design

The analysis shows that generative AI reshapes creative workflows by altering how ideas are produced. Wang (2025) notes that human - AI co-creation extends designers' cognitive reach by giving access to wide aesthetic variations generated through repeated prompting. Haase and Pokutta (2024) similarly describe AI as a "co-creative partner" that encourages divergent thinking and expands creative options.

In event design, such benefits appear through text-to-image tools like Midjourney or DALL·E, which convert abstract themes into concrete visual drafts. Keiper (2023) highlights their value for early brainstorming and for clarifying design intent. The speed and richness of these outputs shorten the ideation phase and improve planning efficiency.

Yet the literature cautions against creative convergence - AI's tendency to repeat patterns found in its training data (Doshi *et al.* 2024; Holzner *et al.* 2025). Vague or culturally detached prompts can lead to homogeneous results and weaker thematic identity. Designers therefore need to maintain curatorial control to ensure AI-generated visuals align with brand culture and audience expectations.

Overall, generative AI acts as a powerful amplifier of creativity, but its outputs must remain anchored in human judgment.

4.2 Originality, Efficiency, and Aesthetic Value in AI-Assisted Design

In relation to the second aim, generative AI enhances efficiency and enables rapid computational experimentation in event design. Studies on diffusion models show that AI can produce high-quality visuals with refined lighting, textures, and composition in seconds (Croitoru *et al.* 2023; Yang *et al.* 2022). This capability lets designers review multiple thematic options at once - something previously limited by time and resource constraints.

Holzner *et al.* (2025) further find that human–AI teams outperform humans alone on visual ideation tasks. In practice, this translates to faster prototyping in event production, allowing immediate visualization of décor, layouts, and moodboards. AI-generated outputs also introduce unexpected aesthetic combinations, which can prompt fresh design directions.

Concerns remain about originality. Erickson (2024) and Bender (2024) argue that algorithmically generated content may lack emotional depth or cultural nuance. While AI can produce visually appealing results, it cannot yet create symbolic resonance or experiential storytelling on its own. Thus, the originality of AI-assisted design rests on human interpretation - designers shape, refine, and assign meaning to the generated forms. When this partnership occurs, AI becomes a creative extension rather than a replacement, supporting designs that feel both novel and emotionally grounded.

4.3 Ethical Considerations and Integration Challenges

The third objective examines the opportunities and challenges of integrating AI into event-planning workflows. Evidence shows clear operational benefits: AI automates routine tasks, improves communication through rapid visual outputs, and broadens creative participation by enabling non-designers to generate ideas through simple prompts (Keiper, 2023). This accessibility supports cross-disciplinary collaboration among planners, marketers, and designers.

At the same time, integration brings ethical, legal, and cultural concerns. Key issues include data provenance, copyright, and algorithmic bias (Al-Fakiry *et al.* 2024). Because models train on massive datasets, outputs may inadvertently contain copyrighted elements or reflect Western-centric aesthetics (Guzman & Lewis, 2024). The U.S. Copyright Office (2025) also notes continued ambiguity around ownership of AI-generated work. As a result, event agencies must adopt disclosure practices and governance protocols when using AI-assisted visuals.

Overall, while AI expands creative capacity, it also demands ethical safeguards. Organizations will need internal policies for design validation, bias checks, and prompt-use guidelines, alongside training for event professionals in responsible AI use.

4.4 Opportunities and Challenges in Integration

The third goal - examining opportunities and challenges in integrating generative AI into event planning - shows clear benefits along with important concerns. AI improves efficiency by automating scheduling, generating visual proposals, and creating audience materials (Keiper, 2023). It also broadens access to creativity through intuitive text-to-image tools (Haase & Pokutta, 2024).

Key challenges persist around authorship, intellectual property, and data provenance, as AI models may draw on copyrighted or culturally biased datasets (Al-kfairy *et al.* 2024; U.S. Copyright Office, 2025; Guzman & Lewis, 2024). Another concern is the risk of creative deskilling if automation sidelines human input (Erickson, 2024).

Overall, the literature suggests that generative AI can greatly enhance event design when used collaboratively and with strong human oversight.

4.5 Thematic Synthesis and Interpretation

Some key insights vanishing into a convergence pull are as follows: Firstly, generative AI changes creativity into a linear process that becomes a collaborative ecosystem of human–machine co-production. Secondly, the use of AI within event design allows creativity to flourish, whereas its automation would depreciate creativity. It enables faster ideation, visual diversity, and communication with stakeholders in the spirit of sustainability, inclusivity, and innovation in the event industry. Therefore, the integration of generative AI brings with it some ethical takeaways that need to ensure transparency, data accountability, and place human creativity in the driving seat of the design process.

This implies that while generative AI supports creativity, it also challenges designers to rethink authenticity, authorship, and aesthetic judgment in the digital age. Hence, there lies the need in the event design realm for a morally conscious, professionally guided, balanced framework to embrace AI.

4.6 Comparative Capabilities of Generative AI Tools for Event Design

Generative AI tools differ in how they support event design, particularly in ideation, visual exploration, and thematic development. Midjourney produces highly stylized and visually rich images, making it ideal for moodboards and atmospheric concepts. Its strength lies in aesthetic impact, though it offers limited control over precise spatial or structural details.

DALL·E generates more literal and accurate visuals, which is useful for props, décor elements, signage, and brand-aligned motifs. Its stronger editing and manipulation features allow designers to refine specific components of a concept with greater precision.

Stable Diffusion offers the most customization because of its open-source nature. Designers can fine-tune models, integrate brand-specific datasets, and adjust parameters through tools like ControlNet. This makes it valuable for agencies needing consistent stylistic output, though it requires higher technical skill.

Together, these platforms provide complementary strengths: Midjourney excels in style and mood, DALL·E supports clarity and alignment with design intent, and Stable Diffusion delivers precision and customization. Understanding these differences helps event professionals choose the right tool for each stage of the creative workflow.

5. Results and Discussion

5.1 Overview

The thematic synthesis of secondary data results points to generative AI reshaping creative processes in event design. A common pattern manifests in past accounts of these events: in any scenario where AI is involved, it does not replace human creativity; rather, it supplements it by quickly acting as an ideation partner in conceptual evolution, possibilities for esthetic exploration, and reconsidering traditional ideas around authorship. We discuss these results in relation to the three main research objectives, with each generating a separate implication for the creative, operational, and ethical facets of the industry.

5.2 Cross-Thematic Insights and Implications

In a synthesis of these findings, there emerge three implications of a more general nature. The first implication posits a paradigm in which generative AI transforms creativity into an ecology, whereby innovation results from the iterative exchange between human insights and computational intelligence. The hybrid notion of creativity stands in contrast to the traditional concepts of authorship and, therefore, produces richer and more dynamic outputs.

Secondly, the AI enhances experiencing design and communications; event practitioners iterate faster, concretize ideas more richly, and present them to clients with less cost. Nonetheless, sustaining originality calls for human intervention requiring critical judgment, contextual awareness, and ensuring that machine-produced aesthetics align as much with cultural and emotional intention.

Thirdly, the ethical question remains absolute: as Bender and Erickson have each separately highlighted in 2024, being reliant on AI unchecked could demean creative labor and standardize artistic expression; hence, the event industry would have to evolve ethical frameworks in protection of creative integrity while accepting technological advances. The proscription of mechanisms governing AI, including transparency of authorship and right remuneration of human creators, as well as culturally inclusive data sets, will mark how sustainable event design aided by AI will be in the long run.

5.3 Summary of Findings

The analysis reveals that AI-fueled creativity enhances human ingenuity but cannot completely supplant it in conceptualizing event theme and design. Generative tools enlarge the ideational scope, speed up the visualization, and popularize its creative participation. They, however, require an interpretative domestic culture, human emotion, ethics, and cultural intelligence to give meaning to the output. Overall, AI is most effective when treated as a co-creator that complements rather than replaces human imagination and the creative depth behind successful events.

Based on these discoveries, the concluding section will draw together the conclusion and recommendations, focusing on routes to responsible AI lifestyle applications and avenues for future research in creative event design.

5.4 Implications for Practice

Generative AI has important implications for event designers. It enhances early-stage ideation by enabling rapid visual exploration, but designers must retain curatorial control to ensure that AI outputs remain contextually accurate, culturally sensitive, and aligned with client expectations. Strengthening skills in prompt formulation, critical evaluation, and aesthetic judgment becomes essential for balancing efficiency with originality. Treating AI as a collaborative partner rather than an autonomous creator helps maintain the emotional depth and narrative coherence required in professional event design.

For educators and training institutions, the rise of generative AI highlights the need to incorporate AI literacy into event design and hospitality curricula. Students require structured exposure to prompting techniques, iterative human–AI co-creation, and ethical issues such as data provenance, authorship, and bias. Integrating AI-enabled studio exercises can help future practitioners understand how to blend human intuition with computational generation while avoiding overdependence on automated outputs.

For policymakers and industry bodies, generative AI creates an urgent need for clear guidelines governing copyright, disclosure, and ethical design practices. Policies must address dataset licensing, transparency when AI-generated elements are used in proposals, and protections for human creative labor. Establishing governance frameworks that promote responsible AI use will support innovation while safeguarding professional standards and cultural integrity within the event industry.

Conclusion

This study examines how artificial intelligence influences creativity in event theme development and design conceptualization. Drawing on secondary academic and industry sources, it addressed three key objectives: understanding how AI contributes to creative processes, determining whether AI functions as an enabler or co-creator alongside human designers, and identifying ethical concerns associated with AI-assisted event design. The findings show that human creativity increasingly interacts with AI systems, as designers combine their intuition with AI-generated outputs. Diffusion-based generative models enable rapid ideation, visualization, and prototyping, accelerating many stages of the design process. These tools expand creative possibilities but also raise questions about authorship, originality, and professional identity.

A central paradox emerges: while AI can enhance originality and coherence at the micro level, it may also narrow stylistic diversity when used without critical oversight. Event designers must therefore position AI as a supportive ideation partner rather than a dominant creative force to maintain thematic integrity, emotional resonance, and cultural relevance. Ethical considerations remain essential, particularly related to data provenance, copyright, and cultural bias. The growing complexity of attribution in AI-generated content underscores the need for updated guidelines and clear disclosure practices. Successful integration of AI into event design will require governance frameworks, professional training, and a balanced creative approach that preserves human judgment.

Future research should build on this conceptual analysis through empirical studies. Comparative evaluations of platforms such as Midjourney, DALL·E, and Stable Diffusion could clarify how each tool influences idea diversity, creative quality, and design efficiency. Experiments involving designers, students, and clients would help assess perceptions of human - AI co-creation and its impact on workflow dynamics. Longitudinal studies may reveal how AI adoption reshapes collaboration, responsibility, and innovation within event agencies. Additionally, real-world case analyses are needed to explore legal and ethical issues, such as authorship, licensing, and data transparency. Such investigations will help refine conceptual models and support responsible, industry-ready applications of AI in creative event design.

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Credit Authorship Contribution Statement

Rachita Pradeep Hulekal: Conceptualization; Literature review; Methodology; Analysis; Writing – original draft; Writing – review and editing.

Shravya AS: Supervision; Validation; Critical revisions; Writing – review and editing. Data curation; Visualization; Writing – review and editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

Generative AI tools were used only to support grammar refinement, structural clarity, and formatting. All ideas, interpretations, and conclusions were developed by the authors, and all AI-assisted text was reviewed and validated for accuracy.

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Reimagining Dussehra through AI-Generated Anime: Examining Global Perceptions of Indian Culture

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Abstract: To examine how generative AI reimagines Dussehra through anime-style visuals and to assess how these representations influence global perceptions of Indian culture.

The study uses a qualitative analysis of secondary data from AI-art platforms, digital archives, and audience discussions. It interprets visual patterns, circulation dynamics, and viewer responses through the proposed AI–Culture–Perception Framework.

AI-generated anime increases the global visibility of Dussehra by translating mythic symbols into accessible visual forms. However, the outputs may simplify cultural nuances or introduce aesthetic distortions due to algorithmic bias and stylistic blending. Audience reactions show a mix of appreciation, curiosity, and concern about authenticity.

The study offers one of the first analyses of festival representation through AI-generated anime and introduces a conceptual model explaining how cultural meaning is reshaped through AI mediation and platform circulation.

The research relies solely on secondary data; future studies should include empirical audience surveys for deeper insight.

Keywords: Artificial Intelligence; anime; cultural representation; Dussehra; global perception.

JEL Clasiffication: Z11; O32; Z33; R11.

1. Introduction

1.1 The Background and Rationale of the Study

Cultural festivals function as key carriers of heritage, shared memory, and collective identity across societies (Berti, 2020). In India, Dussehra - marking Rama's triumph over Ravana - continues to attract national and international attention through its dramatic enactments, ritual symbolism, and public performances (Goswamy, 2021). As digital technologies expand the ways in which cultural narratives travel, festivals such as Dussehra increasingly appear in global media ecosystems through diverse formats including livestreams, documentaries, and animated retellings.

Among these shifts, generative artificial intelligence (AI) has introduced new pathways for visualizing culture. Particularly notable is the rise of AI-generated anime, which merges machine-driven creativity with the aesthetic features of a globally popular animation style. Despite these rapid changes, academic inquiry into how AI-driven visual media represent traditional festivals - and how such representations shape global perceptions - remains limited. This gap provides the central motivation for the present study.

1.2 Overview of AI in Cultural Representation and Media

Generative AI has become deeply integrated into cultural and creative industries, shaping animation pipelines, digital storytelling, and heritage interpretation (Gürel, 2025). Its capabilities - ranging from character generation and motion synthesis to automated scene creation - enable rapid visual experimentation that can redraw how cultural content is produced and consumed. These developments offer opportunities for accessibility and visibility, particularly for cultures traditionally underrepresented in global media.

However, scholars caution that generative systems also pose challenges. Biases embedded in training datasets can influence how non-Western characters, symbols, and environments are depicted, potentially reinforcing stereotypical or exoticized imagery (Ghosh *et al.* 2024). Concerns around authenticity, algorithmic interpretation, and cultural accuracy complicate the role of AI as a mediator of tradition. While the technical potential of AI in animation is widely recognized, the cultural implications of these tools - especially when applied to heritage narratives - remain underexplored.

1.3 Dussehra Festival: Symbolism, Mythology, and Global Influence

Dussehra's narrative richness makes it a compelling case for studying AI-mediated cultural representation. Its mythological themes, heroic archetypes, and visually striking symbols such as Rama's bow, Ravana's ten heads, and the effigy-burning ritual lend themselves well to animated reinterpretation. As digital platforms rapidly absorb and circulate reimagined cultural content, Dussehra appears increasingly in global spaces, where it is encountered by audiences unfamiliar with the festival's deeper cultural logic.

These shifts raise essential questions: How do AI-generated visuals translate mythic meaning? What aspects of the festival are emphasized, altered, or recontextualized? And how do global audiences interpret these reimagined forms? Investigating these dynamics allows for a deeper understanding of AI's emerging role in cultural diplomacy, soft power, and global heritage communication.

1.4 The Emergence of AI-Made Anime as a Medium for Cultural Expression

Anime has long served as a vehicle for transcultural storytelling. Its visual language - character exaggeration, emotive symbolism, and dynamic motion - allows narratives to cross borders with ease. When combined with generative AI, anime evolves into a hybrid global medium that can reinterpret cultural forms through computational aesthetics. AI-generated anime does not simply replicate Indian mythological content; it blends stylistic conventions, tonal features, and symbolic cues from multiple visual traditions.

This hybridity raises both opportunities and tensions. On one hand, AI-anime may make Indian festivals more accessible and emotionally resonant for international audiences. On the other, algorithmic reinterpretation risks distorting cultural nuance or flattening region-specific meanings. Understanding these convergences is essential for assessing AI's potential as a tool for cultural translation.

1.5 Research Problem, Objectives, and Questions

Although Dussehra has been widely examined in relation to ritual, community identity, and tourism, only a small body of work explores its representation in digital media - particularly through AI-generated forms. Existing AI research tends to focus on creative innovation or technical capabilities, leaving the cultural and perceptual dimensions largely unaddressed.

This study fills this gap by examining how AI-generated anime reimagines Dussehra's characters, symbols, and moral narratives, and how global audiences engage with these digital reinterpretations. It aims to contribute to emerging discussions on algorithmic creativity, cultural representation, and the circulation of heritage in the age of generative AI.

The study is guided by three questions:

RQ1: How does AI-generated anime reinterpret Dussehra's narrative elements, characters, and symbolic motifs?
RQ2: How do global audiences perceive and interact with these AI-mediated representations of Indian culture?
RQ3: How do digital platforms and AI trends shape the circulation and visibility of Dussehra-themed anime content globally?

1.6 Scope, Limitations, and Organization of the Study

This research relies exclusively on secondary data collected from academic literature, AI-art platforms, digital archives, and audience interactions on public forums between 2020 and 2025. While this approach enables broad cultural and aesthetic analysis, its reliance on publicly available digital materials limits the depth of audience-specific insights. As primary ethnographic or survey data are not included, interpretations reflect observable patterns rather than measured attitudes.

The article proceeds as follows: Section 2 reviews literature on media representation, anime and cross-cultural storytelling, AI-driven creativity, and festival narratives. Section 3 outlines the qualitative methodology. Section 4 presents the case analysis of how AI-generated anime reimagines Dussehra. Section 5 discusses implications for cultural representation, education, and policy. Section 6 concludes with recommendations for responsible, culturally grounded AI-mediated storytelling.

2. Literature Review

2.1 Theoretical Perspectives on Cultural Representation in Media

There are many theoretical antecedents related to culture representation in the media since Stuart Hall's work on encoding/decoding and representation (Bode, 2024) that opens a horizon for meaningful work of media about culture. For example, it is quite evident, only now, that some scholars argue media are no longer a mere mirror of cultural system but have usurped space for active meaning making that constructs and contests cultural Identities (Dey, 2024). Critical cultural/media possibilities, such as who gets talked about, to whom, in terms of what, by what method, with what effect, and many more, are not central for a critical understanding of media. Power, agency, context, and intersectionality must be central in analysis of media representations. For instance, critical media effects scholars argue that media cannot ignore but move from the margins of explanation to the central stage if one deals with power, agency, context, and intersectionality in analyzing media representations (McQuail & Windahl, 2023; Bridging Critical Cultural Communication & Media Effects, 2019). Such showed the transmission of cultural representations via media in globalized digital contexts since they almost always have repercussions on intercultural understanding, diaspora identity, and soft power.

2.2 Anime and Cross-Cultural Storytelling: From Japan to Global Media.

Anime had evolved from a Japanese phenomenon to a globally comprehensible visual language that could potentiate unreachable cultural and emotional meanings. Thanks to the stylistic hybridity of anime, myths can be reconstructed and iconic female bodies transmitted across national borders. Liang (2005) likened it to a medium through which transnational storytelling could be consumed. In India the story of the power of anime over young minds is explained in another setting, with futurological animators adopting the narrative and aesthetic grammar of anime to reinterpret local myth. In a "Ghlocal" adaptation, Bhosle (2024) observed that "transcreated" an Asian middle-class audience-faithful myth with transnational appeal-let era India perform its mythic tales, such as those of Dussehra, for fresh audiences. AI-generated animations reach such situations further in spreading cultural dialogue beyond national borders into global levels by making traditional narrations from India to a global universal reading signifying the same interpretations and narratives as before but with proximity to its symbolic content.

2.3 Artificial Intelligence in Animation and Digital Creativity

Currently it uses AI to redefine the creation of animated characters, to add automatic motion, and to create narratives through generative modeling. Stark identifies this shift as a new creative paradigm, which machines collaborate with artists. Hemment, *et al.* highlight the concept of being experiential AI, where human agency remains central to algorithmic creativity. Abootorabi has broad stroke coverage on such systems, which also includes how multimodal learning advances emotional realism in animated characters. Caramiaux further argues that AI is the conscience of creative work altered the social and ethical dimension, crossing the lines between authorship and automation. Towards these developments, the position of animated creations Ai-driven is folded-folded-in as both technological innovation and philosophical questioning about creativity, agency, and cultural translation-by being animate AI-driven.

2.4 Festivities as Cultural Narratives: A case of Dussehra

There is a liveness to the narratives that Dussehra like festivals engulf us in. Through the shared action, myth and symbolism performances, communities are brought together. This is about embedding AI in festival communication and management, and AI helps to engage the audience more deeply through data-driven storytelling. On the other hand, Lopes, Melo-Cardoso, and Camilleri (2025) note how visitor experience is enhanced by AI systems, which make possible personalised cultural interactions, and leading to the condition of "smarter crowds." The author further warned that the risk of making sacred rituals commodities is real for the visit of digitalisation. The innovation and authenticity of things must be properly balanced. Dussehra is just another great space being shaped by techniques coming into foreground, which would bring the philosophical spiritual experience together."His insights into the sacredness of Dussehra as a platform for sites of mediation bring into focus knowledge-based ways in which technology can empower and compromise cultural practices."

2.5 AI-Generated Art and Global Cultural Perception

AI-generated art signifies the crossing of human creativity and computational aesthetics making a difference in how global audiences perceive culture. Gürel (2025) denotes that they are more of "co-experiential" spaces where meaning is made by co-citation of creators with their audiences through the operation of algorithms. Iervolino, Amendola, and Sabato (2025) discuss that bringing in new constructs into the new spaces would necessitate legitimacy for algorithmic authorship inside cultural institutions. To note, according to Visanich (2024), predictive analytics now influences audience engagement strategies. In so doing, the development moves toward a reactive cultural ecosystem merging heritage, data, and participation. As in the case of, among Indian festivals like Dussehra, AI-generated anime, thus, becomes a cultural object, in part, and a tool for soft power intermediating intercultural understanding through new modes of adaptive storytelling-the visual formats.

2.6 AI and Computer Systems in Family Culture.

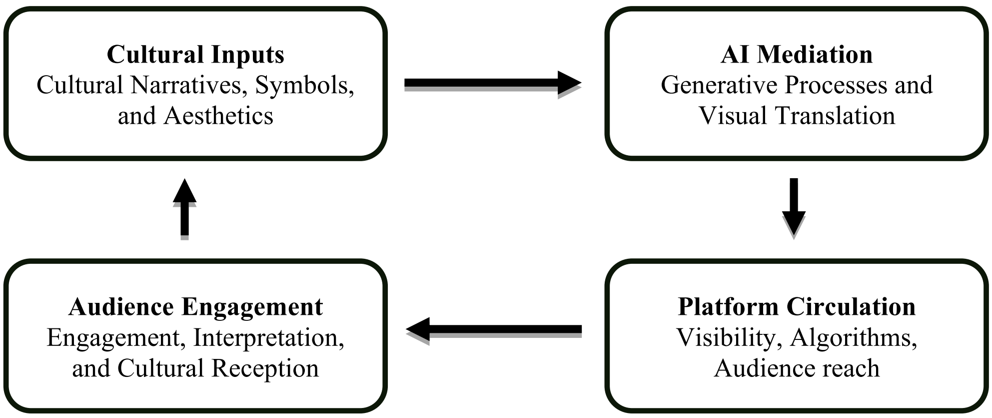
Starting this review of literature as bases drawing from it for conceptual framework development that combines media representation theory (Bode, 2024; Dey, 2024), cross-cultural storytelling via anime (Bhosle, 2024), and AI-driven creative production (Stark, 2024; Qadri *et al.* 2025), the AI-generated anime of Dussehra can be seen as just such a mediated cultural form influenced by platform logics, production affordances, and audience decoding dynamics, which helps to understand how narratives, symbols and values of Dussehra are interpreted, disseminated and received by global audiences through AI-anime.

2.7 Conceptual Framework: The AI–Culture–Perception Model

This study introduces the AI–Culture–Perception Framework to explain how Dussehra's cultural narratives are reshaped through generative AI and global digital platforms. Drawing from literature on media representation, anime-based storytelling, AI creativity, and festival studies, the framework shows how traditional elements - mythic characters, ritual symbols, and visual motifs - enter AI systems as cultural inputs. Through computational processes such as visual translation, stylistic blending, and algorithmic recombination, generative models reinterpret these inputs, producing hybrid anime-style representations that merge cultural specificity with global aesthetic conventions.

Once generated, these visuals circulate across platforms like YouTube, TikTok, and Reddit, where algorithms influence visibility and audience reach. Global viewers respond with varying interpretations, ranging from fascination and cultural appreciation to concerns about authenticity and distortion. These perceptions feed back into the circulation cycle, shaping how future AI-generated representations evolve. Overall, the framework highlights a continuous, cyclical movement in which cultural meaning is reinterpreted and redistributed through AI-mediated media.

Figure 1. The AI–Culture–Perception Framework



This model conceptualizes how Dussehra's cultural narratives move through generative AI processes, circulate across digital platforms, and shape global audience perceptions. It illustrates four interconnected components - cultural inputs, AI mediation, platform circulation, and audience perception - demonstrating the cyclical flow through which cultural meaning is reinterpreted, visualized, and received within AI-driven media environments.

3. Methodology

3.1 Research Design

This qualitative case study explores how an AI-created anime named Fogas reinterprets the Indian festival of Dussehra and converts its cultural symbolism into the digital realm. The case study method facilitates an in-depth examination of the intersections between cultural meaning, technology, and media in AI-mediated art. Derived from Yin's classic model, this design incorporates hybrid qualitative tools such as computational creativity and digital ethnography (Viera, 2023). Using the frameworks of Hemment *et al.* (2023) and Caramiaux *et al.* (2025), co-creative dynamics in human intention and algorithmic decision-making engender hybrid cultural meanings. Supported by Pitakaso (2025), the project proposes an AI-assisted analysis of visual, textual, and symbolic interactions. The interpretive framework privileges meanings over measurements, thus viewing AI-mediated media as a lens to perceive cultural representation and creative convergences in contemporary India (adapted from Erickson, 2024).

3.2 Nature and Sources of Data

This study applies itself in the secondary data method that has been reported from reputable sources through reviewed articles found in the public domain and published between 2020-2025. Academic journal articles, conference papers, digital repositories, and reviews related to AI in animation, cultural representation, and festival studies are part of the study materials. Additional data with equal relevance-were secured from UNESCO (2023) and PwC (2024) reports for technology-led innovation in cultural output.

Moreover, supplementary data are found on certified open-access platforms such as YouTube, Artbreeder, and interactions on Reddit in the CreativeAI forums hosting AI-made art and animations. Guo *et al.* (2023) argue that significant augmentation was made for comprehension of algorithmic creativity or cultural reinterpretation centering around digital databases and large data. Likewise, Sailesh (2024) and Lopes, Melo-Cardoso, and Camilleri (2025) lay down the fact that the infusion of a proper AI analytics system employs the clear understanding of the document and insight into contemporary audience behavior.

His research was restricted to all sources for credibility, authenticity, and relevance. Sources that dealt directly with AI art, animation, or Dussehra festivals were included in the research material.

3.3 Sampling and Selection Criteria

To identify variously themed and topic related secondary sources for the study, purposive sampling strategy was employed to collect samples. They looked for academic research citations from databases like Scopus, Web of Science, and SpringerLink, and they used key terms like "AI animation," "cultural representation," "festival media," and "Dussehra." This approach was useful because it addressed both theoretical and practical aspects of AI programming for creativity. The digital component covered content analysis of AI-generated art, anime videos, and festival reinterpretations found on open platforms.

Priority was given to three categories of data, first and foremost, (1) scholarly sources of reports, and studies into media creation involving AI; (2) academic/popular discourse on scenarios discussing cultural mythic representation within India; and (3) great audience analyses or debate on AI-moderated cultural content in the world. Grounded in Silverman's words, the methodology results surface triangulated studies across academic ideation, digital artefacts, and audience reception. However, as digitalization is becoming more and more deep in many aspects of cultural narrative, researchers should be highly conscious of the serious issues of fidelity in this context. With Iervolino, Amendola, and Sabato, Chen (2025) can endorse their statement about having a very strong curatorial sensitivity alongside institutional oversight in choosing materialistic data to investigate a great deal of scientific evidence against machine-generated pieces.

3.4 Data Analysis

The data was done after qualitatively analyzed through content analysis and on thematic basis, to have an interpretation of symbolism, representations, and audience perception (Braun & Clarke, 2021). The process was accomplished in three stages - re-engagement at the data level, beginning with the generation of preliminary codes and then the combination of these codes to produce main thematic categories.

Three crucial keywords were discovered that were mythic reinterpretations, AI aesthetics, and decoding global culture that was reinventing Dussehra's visual and symbolic essence through AI. Considered on Liang's (2025) cross-cultural semiotic framework, the exploration focuses on examining predictive audiences in relation to digital engagement patterns (Visanich, 2024). Only for this purpose, an approach called hermeneutic interpretation will be adopted to digital humanities since it offers a window on the interpretation as multiple-layered insight into how the meaning is illuminated within media culture created through AI.

Interpreting the Microfiche is a weaving of academic perspectives, visual algorithmic and user comments in order to ground the findings. Thus, according to 1527), the strategy captures hybrid cultural symbols that mean morph due to the interplay with the AI systems, from the audiences, and as they are represented in art.

3.5 Ethical Findings and Credibility of Sources

The integrity of researching, or any other endeavor, rests on the shifting sands of knowledge, hardly verifiable. Transparent citation, responsible data interpretation, and acknowledgment of intellectual property rights, etc., result in ethical integrity of its findings. Furthermore, all data and materials related to arts, culture, and media used during the analysis for this study have been accessed through publicly available sources, ensuring open-access standards in some way. Such credibility is done by cross-verification of publication authenticity, author affiliations, and indexing reliability.

Gurel (2025) maintains that the development of cultural production privileging AI has concomitantly engendered new ethical issues that address the owning of bias as well as the cultural loyalty; hence, these matters must be increasingly reckoned with concerning the content analysis. Another perspective is expressed by Iervolino, Amendola, and Sabato (2025), because as they detail the responsibility of researchers and curators to uphold transparency as well as context fidelity when dealing with algorithmic art and cultural data, it arises a lot indeed. This paper is guided by these facts in sourcing anything, in ethical concern, and within interpretive caution for all second data. Consequently, the network presented the finding, warning of reflection about the real problems associated with the research in AI, such as algorithmic opacity, representation bias, and variability in context. The article was produced according to this methodology, in a compromise between analytical depth and ethical and scholarly integrity, aiming to produce responsible input to urgent discussions on AI-produced cultural rendering.

4. Case Study Analysis: Dussehra Reimagined through AI-Generated Anime

4.1 AI-Generated Toons Illustrate Dussehra: Narratives, Characters, and Values

Dussehra symbolizes virtue's victory over vice, it was historically portrayed in religious, performative, and cinematic art forms. But now it has gushed forth in AI-recognized Japanese-style animes as centuries-old recapitulation unites Indian mythological narrative with worldwide visual languages. By 2025, between three and six digital creators will have used Midjourney, Runway ML, and YouTube to synthesize Ramayana's ethical themes and stylistic Japanese-anime vernacularities.

Figure 2. AI-Generated Anime Interpretation of Rama and Ravana

Characters like Rama and Ravana can be rediscovered in cyberspiritual settings where Hindu cosmology intersects with digital futurism. Hemraj (2025) pointed out that AI blurs the creative authorship with the help of seamless blending of cultural storytelling and technology-driven production. AI helps produce visual results that look indigenous and are universally resonant through such incorporation, an algorithm learning from various data gathered all over the globe and reinterpreting mythic archetypes with a transnational aesthetic. This New Age Anime churn could redeem the old-timey two-armed nature of Dussehra into murkier, more modern, and universally accommodative grounds.

4.2 Aesthetic and Symbolic Reinterpretation: Ramayana, Ravana, and Moral Duality

The portrayal of Rama and Ravana in anime can offer us a mature perspective in the sense that they are shown as far from traditional devotional or moralistic impressions-too innocent to be true-indeed we see a demonstration of both figures in line with many of Bhosale's (2024) morally ambivalent heroes and villains current in the anime context. Thereby, in AI renditions, Ravana: Multi-dimensional blending of demonic and post-human properties merges into an antihero, with Rama layering as a digitally illuminated, warrior-sage types. Also, Gürel (2021) asserts that AI-driven art would contribute through the blending of visual languages from different traditions to the emergence of a cultural hybridity. This way, AI-created Dussehra-themed anime becomes a hybrid cultural text of popular technological imagination with mythic memory, inviting global audiences to place in reimagined narratives of India.

Figure 3. Anime-style Depiction of the Rama–Ravana Confrontation

4.3 Global Platforms and the Circulation of Dussehra Narratives

The dissemination of AI-generated Dussehra content across global digital platforms illustrates how new media ecosystems amplify cultural visibility. On YouTube and TikTok, AI-animated shorts tagged under #RamayanaAI or #DussehraAnime reached cumulative view counts exceeding 1.5 million between 2024 and 2025 (PwC, 2024). Similarly, Reddit communities such as r/aiart and r/AnimeCulture featured thousands of cross-cultural reinterpretations of Indian mythic figures during festival periods. These data points reflect what Zhao and Zhang (2023) describe as the machine-learning diffusion effect - AI's capacity to replicate and evolve aesthetic motifs across diverse online networks.

Viewer commentary analysis on YouTube threads indicates two dominant interpretive positions: international audiences often express fascination with India's mythological richness, while Indian users debate issues of authenticity and cultural ownership. This aligns with Qadri *et al.* (2025), who advocate for "thick evaluations" of AI-generated cultural representations that incorporate the social context of creation and reception. In these exchanges, AI-generated anime becomes a digital space of negotiation between cultural pride and postcolonial critique.

4.4 Audience Perception, Cultural Reception, and Engagement

It showcases that how algorithmic creativity would democratize and at the same time disturbs a culture's narrative about the AI-anime content. The extent of positiveness comes out in the global reaction of the hybrid aesthetic as an entry point, through which people perceive accessibility into Indian mythology. Part of the Indian audience, however, continues to disapprove and see it as a misinterpretation of sacred symbols by the AI, echoing most of AI's democratizing potential conferring with local kinds of cultural sensitivities by Hemraj (2025).

This tension between continuity and discontinuity of technology is described by Erikson (2024) as maintaining continuity in creativity while allowing reinterpretation of cultural forms but also destroying traditional forms of authorship and curatorial hierarchy. For a festival like Dussehra, it would mean that AI-anime should also function as something developed for cultural diplomacy, but as a contested site for meaning. Again, the case sketches Gürel's (2025) argument about a much wider problem. It clarifies how involved such experiences are bound to be when the industries that are creative become participatory and cross-national and the whole distinction between cultural producer and consumer dissolves.

4.5 AI-Anime vs Traditional Representations in Communication Media

It is transformation of concepts important to a given mental mode-old televised Ramlila, ancient folklore-based film adaptations, with contrast against the ultra-common, ultra-modern AI-created celebrated-Dussehra anime representation. Ritual and devotion, with stories of moral pedagogues, makes up most of the old media message in the narrative most community-centered concepts concerning national identity. And this is just where modern anime from AI stands, choosing emotion over ritual and making Dussehra such a dramatic transcendence fit not only for national action but for a global audience.

Stark (2024) says that such a shift in expression is possible because there is an artificial intelligence which claims authorship through algorithms; that is to say, the intelligence of the contemporary medium author mediumizes AI which becomes part and parcel of the medium as Translator and Collaborator. The shift, therefore, is evident towards the embrace of an affective sort of language of storytelling that is more symbolic and then emotionally charged entrenched in anime's language. In the words of Hemraj (2025), much of this has indeed resulted in a new Creative Ecology where culture is co-authored by human beings and machines.

So, Dussehra is revised by AI not according to modernity but according to the cultural recognition of the transformation in the conversation on major discussions about truth, property, and representation in global digital creation and ethics in AI.

5. Discussion

This study explored how AI-generated anime reimagines Dussehra and influences global perceptions of Indian culture. The findings show that generative AI functions not only as a technical tool but as a cultural mediator that reshapes narrative meanings, symbolic interpretations, and modes of cross-cultural engagement. AI-driven visuals amplify festival visibility, translate complex myths into accessible anime aesthetics, and circulate rapidly across global platforms. At the same time, concerns emerge around authenticity, algorithmic bias, and cultural ownership, reflecting tensions between innovation and tradition.

5.1 Cultural Implications

AI-generated anime has the potential to broaden cultural understanding by presenting Indian mythologies in formats that resonate with global youth cultures. By visualizing Dussehra through familiar anime grammar - dynamic framing, expressive symbolism, and stylized character design - AI makes traditional narratives more accessible to audiences who may not have prior exposure to Indian festivals. This contributes to soft power, enabling India's cultural symbols to circulate beyond geographic boundaries.

However, the findings also show important cultural risks. Algorithmic interpretations may oversimplify or distort layered mythological meanings. Training data dominated by Western or East Asian aesthetics can unintentionally embed biases that alter the visual authenticity of Indian characters and symbols. These distortions can lead to forms of algorithmic exoticism, where cultural nuance is replaced by generalized or hybridized imagery. Thus, while AI expands cultural reach, it simultaneously necessitates careful human oversight to maintain fidelity to cultural context.

5.2 Educational Implications

AI-generated anime holds strong potential as an educational tool for cultural learning, especially for younger audiences who engage more readily with visual and narrative media. Teachers, cultural institutions, and digital learning platforms can use AI-generated visuals to illustrate festival origins, characters, moral themes, and regional variations in creative ways. Interactive AI systems also allow learners to experiment with prompts, observe how visual representations shift, and critically reflect on cultural accuracy.

Yet, the educational value depends on guidance. Without curated frameworks, students may internalize inaccurate or culturally diluted representations. Educators must therefore integrate AI media with contextual explanations, comparative analysis, and discussions about representation, bias, and ethical use of technology. Doing so transforms AI-generated anime into a powerful tool for critical cultural literacy, helping learners understand both the possibilities and limitations of AI in cultural storytelling.

5.3 Public Policy Implications

As generative AI becomes a major agent in cultural communication, policymakers face the challenge of establishing guidelines that protect cultural integrity while encouraging creative innovation. The findings underscore the need for standards on transparency, such as labeling AI-generated cultural images, documenting data sources, and disclosing when cultural symbols have been altered or stylized.

Policies related to copyright, ownership, and the use of culturally sensitive imagery must also be strengthened. Traditional communities may have legitimate concerns regarding the remixing or reinterpretation of sacred symbols by AI systems. Developing ethical frameworks - possibly in line with UNESCO's principles on AI and cultural diversity - can help ensure respectful, context-aware AI usage.

Additionally, policy bodies should consider supporting research, digital literacy programs, and collaboration between technologists, artists, and cultural experts. Such measures would help safeguard cultural authenticity, promote responsible AI deployment, and foster sustainable cultural innovation.

Conclusion and Recommendations

This study examined how Dussehra is visually reimagined through AI-generated anime and how such representations influence global perceptions of Indian culture. By analyzing secondary data from AI-art platforms, digital communities, and audience responses, the research demonstrates that generative AI has become a significant mediator of cultural meaning. Its capacity to translate complex mythological narratives into globally familiar anime aesthetics expands the international visibility of Dussehra while simultaneously reshaping how its symbols and values are interpreted.

The analysis addressed three research questions. First, AI-generated anime was found to reinterpret Dussehra's narrative through stylized visual forms - heroic exaggeration, intensified color palettes, and hybridized iconography - creating novel yet sometimes simplified aesthetic versions of traditional motifs. Second, audience reactions reveal diverse patterns of engagement: global viewers often express fascination and cultural curiosity, while Indian audiences show both appreciation for creative reinterpretation and concern about authenticity and symbolic accuracy. Third, platform circulation plays a central role in amplifying certain themes - such as dramatic battles or heroic archetypes - thereby guiding how festival meanings travel and are consumed in digital spaces.

The study contributes to emerging research on AI-driven cultural representation by proposing the AI–Culture–Perception Framework, which maps how cultural narratives move through generative systems, platforms, and audience interpretation. This conceptual model highlights the cyclical nature of cultural production in the AI era, where meaning is continuously reshaped by computational processes, visibility algorithms, and global feedback loops.

Findings also underscore broader implications. Culturally, AI-generated anime can strengthen India's soft power by making festival narratives internationally legible, but it also risks distorting sacred symbols through algorithmic bias or aesthetic homogenization. Educationally, such imagery offers valuable tools for teaching mythology and cultural literacy, provided that learners are guided to distinguish stylized interpretations from traditional narratives. From a policy perspective, the rise of AI-mediated cultural content requires stronger guidelines on attribution, cultural sensitivity, intellectual property, and responsible dataset development.

Overall, the study shows that generative AI is reshaping how cultural festivals like Dussehra are visualized, circulated, and understood. As AI's role in creative production continues to expand, future research should incorporate empirical audience surveys, cross-cultural comparisons, and collaborations with cultural practitioners to deepen understanding of how digitally reimagined heritage influences global cultural dialogue. Ensuring that AI-driven cultural representation remains context-aware, ethically grounded, and culturally respectful will be essential for supporting meaningful and sustainable cultural storytelling in the digital age.

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Credit Authorship Contribution Statement

Uday Kumar G: Conceptualization, literature review, methodology design, visualization, writing - original draft, and writing - review and editing.

Bhaskar Sailesh: Conceptualization, theoretical refinement, analysis validation, writing - review and editing, and supervision of the final manuscript structure.

Declaration of Competing Interest

The author declares no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

Generative AI tools were used exclusively for producing illustrative anime-style visuals included as Figures in the manuscript. These AI-generated images were created by the author for academic demonstration and do not reproduce copyrighted artwork. AI tools were not used for data analysis, interpretation, or writing of the manuscript. All conceptual development, argumentation, and final editorial decisions were made by the human author.

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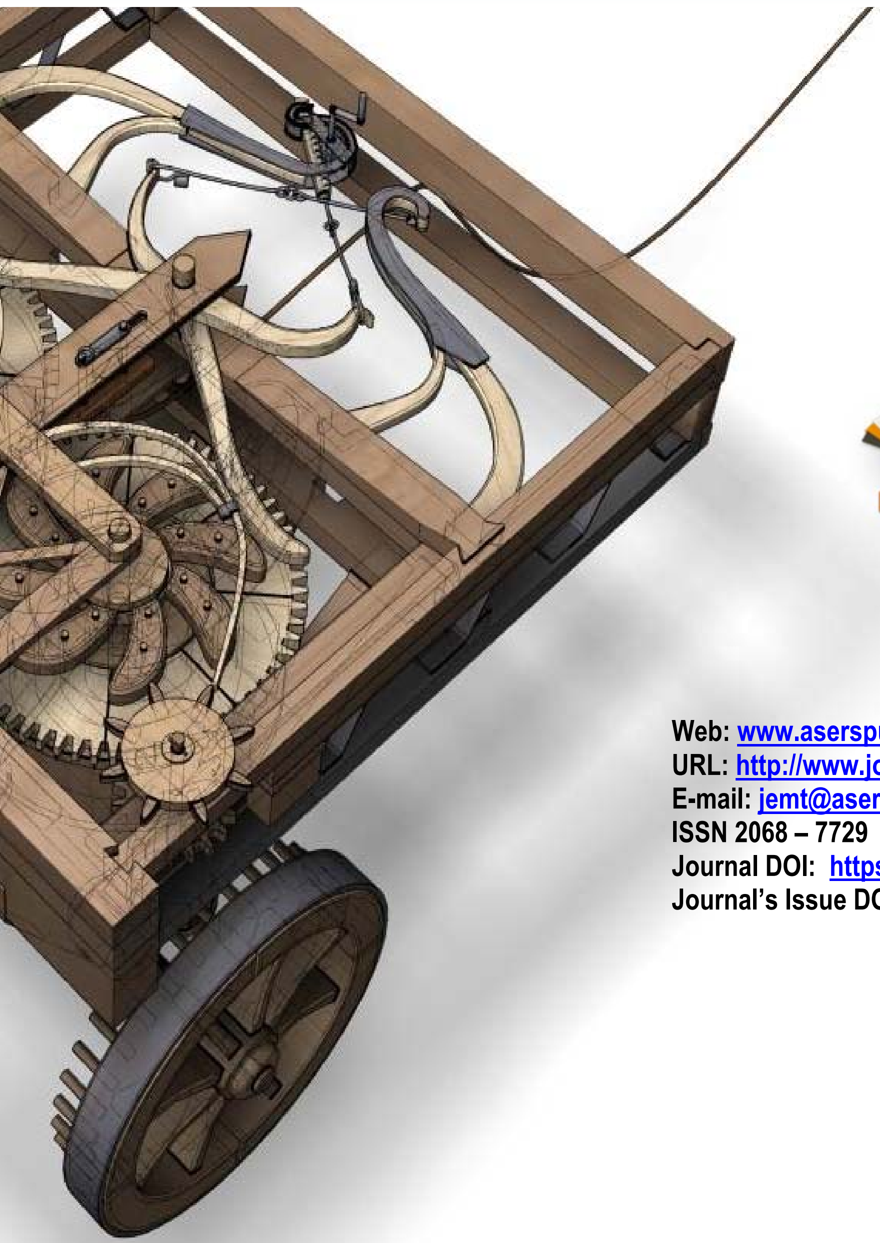

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