

# Is technology everywhere? Exploring Generation Z's perceptions of sustainable tourism in developing countries

Fabiola Sfodera

*Department of Communication and Social Research, University of Rome La Sapienza,  
Rome, Italy*

Lisa Nicole Cain

*Chaplin School of Hospitality and Tourism Management, Florida International  
University Biscayne Bay Campus, North Miami, Florida, USA, and*

Alessio Di Leo

*Department of Communication and Social Research, University of Roma La Sapienza,  
Roma, Italy*

## Abstract

**Purpose** – This study examines the role of technology as a driver of sustainable tourism perceptions among Generation Z.

**Design/methodology/approach** – The work considers the perspective of locals in Pakistan and uses a multi-method, multiphase embedded research design approach.

**Findings** – The research findings demonstrated that technology has a positive correlation with the environmental, socio-cultural and economic dimensions of sustainable tourism perception among Generation Z. Therefore, technology could be considered a dimension of sustainable tourism perception for locals, but perceptions differ significantly depending on the size of the city of the participant. The results of the experimental design phase that utilized picture stimuli demonstrated a linear relationship between technology and sustainability and enhanced their definition and implementation for developing countries.

**Originality/value** – This research diverges from most past research on these topics by focusing on Generation Z, for whom digital media and technology play a crucial role and for whom these technologies are positively correlated with sustainability and its overall perception. Implications for policies and practices for emerging country governments are provided.

**Keywords** Technology, Sustainability, Pro-poor tourism, Generation Z, Domestic tourism

**Paper type** Research paper

## 1. Introduction

Sustainability and technology are often coupled in studies on tourist destinations (e.g. Gössling, 2017), the former as an objective and the latter as an operant and operand resource (Lusch & Nambisan, 2015) that triggers the desired processes of growth and development. For developing countries, they are strategic tourism long-term development factors. The role of digital technologies, and of information and communication technology (ICT) specifically, is considered crucial for stimulating economic growth and is the subject of



---

profound consideration to understand their role in poverty alleviation and pursuing development that is also environmentally and socially sustainable.

Tourism can represent not only a way to encourage economic diversification for developing countries but also serves as the main means of facilitating new forms of involvement of the local population. Tourist activities enable benefits for locals through economic return on investments, creation of local job opportunities (Butzmann & Job, 2017), and the long-term protection of a local area's environmental, cultural and social resources if properly addressed (Asmelash & Kumar, 2019). These policies, actions and implications have been termed "Pro-Poor Tourism" (PPT) (Ashley, Boyd, & Goodwin, 2000; Chok, Macbeth, & Warren, 2007; Saayman & Giampiccoli, 2016).

Developing countries have been disproportionately affected by the effects of coronavirus disease 2019 (COVID-19) on tourism, negatively impacting employment, including hospitality and travel service workers (UNWTO, 2022). As the United Nations (2020) stated, COVID-19 undermined the limits of progress made on Sustainable Development Goals (SDGs) before the crisis, especially for the poorest countries (Naidoo and Fisher, 2020). This situation has accelerated the urgency to reimplement technologically driven, sustainable processes to overcome poverty in these regions, as these processes serve as a strategic tool to create fair and lasting development in the long term.

According to Goffi, Cucculelli and Masiero (2019), sustainability positively affects destination competitiveness and tourism development in developing countries. Sustainable development is the main driver of this ongoing movement to alleviate poverty in developing countries (Streimikiene *et al.*, 2021) and is further supported by the role of technology (Streimikiene *et al.*, 2021). However, sustainability is still seen as a cost rather than an investment, particularly for countries that are in their infancy in developing sustainability policies. This perspective may serve to delay future sustainable development.

Indeed, according to path dependence theory (Sydow, Windeler, Muller-Seitz, & Lange, 2012; Johnson, 2022), past choices determine future decisions. The theory posits that path dependence dimensions that determine the PPT development process are cognitive, institutional, technological and economic. Technology path dependence refers to the dependence on initial technology inputs in poor areas. As demonstrated by Liu and Yu (2022), technology in the PPT has a significantly positive effect on the social and economic sustainability performance of the PPT. However, dependence on the technological path in PPT has a significantly negative effect on the environmental performance of PPT. Consequently, the dependence and use of various factors (e.g. local tourism resources, funds and human capital) in the PPT can promote economic development and improve the lives of poor residents in the short-term but may have negative impacts on local ecological environments. However, Imran *et al.* (2021) have demonstrated how ICT in Pakistan can contribute to poverty alleviation, with an increase in the workforce through higher skills and higher productivity and reduce carbon emissions.

The technological developments of the last few decades have fostered tourism growth on a global scale and facilitated experiences of places and cultures that were previously unattainable. The geography of tourism has been redesigned globally and offers the opportunity for developing, and poor countries to enter the world tourism market. The primary beneficiaries of this technologically driven redesign are those countries that are not very integrated into the global economy but are rich in landscapes and boast relatively unspoiled cultures. In addition to increasing quality tourism, digitalization may also offer a positive impact, and through innovations in travel experiences, production and efficient use of resources, can strongly contribute to achieving the first 2030 (UNSDG) "End poverty in all its forms everywhere" (Winter and Kim, 2021).

The development of digital technologies has also changed the development processes of tourist destinations, which see the involvement and collaboration of the

---

public–operators–residents–tourists. Internet and mobile technologies are pervasive throughout the world, even in the poorest countries (Buhalis & Law, 2008). Nevertheless, the degree of diffusion and use varies, both in terms of infrastructure and the modes of accessing the digital technologies used. From those who use devices and platforms for the first time to those who implement smart technology (i.e. artificial intelligence, cloud computing, IoT and mobile communication) for value creation and sustainability. The ways in which these technologies are used, implemented and influence developing societies, including during the COVID-19 pandemic period (Fennell, 2020), are underexplored.

Technology contributes to value creation globally across the world and especially among generations that make greater use of social platforms. Generation Z represents the generation most exposed globally to these technologies. The generation consists of people born between 1995 and 2010 (Dimock, 2019) and is currently the largest generation. People born in this generation are considered digital natives because they are used to mastering digital skills from the earliest age in operant and operand terms for the satisfaction of their needs from socialization to the creation of meanings (Turner, 2015). Broadbent, Gougoulis, Lui, Pota, and Simons (2017) conducted a study across 20 countries analyzing the behavioral characteristics of Generation Z, demonstrating similar attitudes, behaviors and experiences regarding technology. These references to a generational cohort are based in the tenets of sociology (Mannhiem, 1952), and applied in psychology (Rogler, 2002) and in business disciplines such as tourism (Gardiner, Grace, & King, 2014).

Interest in the traveling behavior of Generation Z is considered an incredibly important field in tourism and travel literature (Corbisiero & Ruspini, 2018), as this generation has a higher propensity to travel in search of new experiences (Wee, 2019), and often seek out remote places and engage in culture-rich activities, while being budget-conscious. These characteristics can lead to both opportunities and challenges for the development of tourism and destinations at the international level (Corbisiero & Ruspini, 2018). Even tourism destinations with scarce technologies and infrastructure can benefit from engaging principles and designing travel experiences that can more easily meet the needs of this new generation (Skinner, Sarpong, & White, 2018). The Z Generation is recognizable by some specific prerogatives. For example, the predisposition for social connection and familiarity with technology often translates into the role of early adopters and strong web users (Turner, 2015). Given their technological aptitude, this cohort of consumers is characterized by an outstanding understanding of the capabilities of devices such as smartphones, PCs and digital cameras, much more so than previous generations (Wood, 2013), as well as the predisposition to use the Internet for information sharing, interaction and collaboration activities during tourism (Haddouche & Salomone, 2018). Connectivity is the foundation upon which the entire digital ecosystem is engineered, and its delivery relies on high-speed communications network infrastructure. The use of technology and social media strongly influences their behavior in many fields and can have positive or negative effects (Singh, 2014). Z Generation is the first generation that cannot relate to a time before the Internet and mobile phones.

Although in the tourism field there are studies that consider the role of technology for destination development (e.g. Ali *et al.*, 2014), the attention paid to developing countries and PPT is still in its infancy. This paper fits into the debate of studies between technology and sustainability in developing countries. Specifically, there has been a lack of studies aimed at understanding how technology influences destination sustainability perceptions. Though digital technologies are permeating developing countries, few scholars have considered the role of technology for tourism development in developing countries (Imran *et al.*, 2021). This is especially important to consider in developing countries where technology implementation follows a non-linear process. Moreover, because generational differences influence demand, the digitally native Generational Z constitutes an ideal lens of analysis through which to

---

understand the perceptions of sustainability and their relationship with technology in a developing country.

Pakistan, a developing country where technology is considered scattered, served as the field of analysis. Because tourism is in its early stage in this developing country, the local population also serves as the main tourism market. Domestic tourism, in fact, constitutes about 80% of the total tourist flows in Pakistan. Thus, Generation Z from regions within Pakistan was the population of interest. Based on these assumptions, this exploratory study used a multi-method, multiphase embedded research design to analyze the role of technology in Generation Z's perception of tourism sustainability in poor areas of a developing country.

## 2. Literature review

The relationships between technology and sustainability are analyzed in a formative way based on technological involvement in sustainable destination development. According to this orientation, technology is an operant resource (Akaka & Vargo, 2014; Vargo & Lusch, 2008) that acts as a mediator of experience or as a tool that promotes tourism development (Ali & Frew, 2014). Although technology still has a broad range of attention in tourism studies, the study of the impact of technology on the perception of resident sustainability is still limited. In this study, we consider technology both as an operant resource that can directly or indirectly influence the tourists' sustainability perception, and an operand resource that could become itself an expression of sustainability (with this criterion we selected the pictures for the analysis). Due to the paucity of research on the role of technology in sustainable tourism perception, the literature review considers both the sustainability of tourism in developing countries and the role of technology in tourism development.

### 2.1 Sustainability tourism in developing countries

Within the last two decades, the merging of concepts of sustainability and tourism has involved significant advancement. One of the most important principles of sustainable tourism is the protection and economic development of local communities and protected areas. The concept of sustainable tourism emerges as a special term that stems from a broader concept of sustainable growth that emanates from local and international tourism in a specific area. Maintaining the quality of the environment, raising the quality of life of the touristic regions and carrying out quality visitor experience are tenets of this concept (Kaypak, 2010). Sustainable tourism can thus be viewed as preserving and sustaining the regional and local charms that are the sources of tourism (Avcikurt, 2015).

Sustainable tourism is "largely influenced by the environmental quality, protection of natural and cultural heritage, and products and resources, along with other values, to protect development and competitiveness" (Angelkova, Koteski, Jakovlev, & Mitrevska, 2012, p. 1). It has laid the foundation for the emergence and development of many types of tourism such as cultural tourism, ecotourism, natural and adventure tourism, gastronomy tourism and landscape tourism. So, the primary goal of sustainable tourism development is to create and implement effective planning measures that lead to maximizing the benefits of tourist potentials of economic and environmental aspects and to reduce the risk of environmental degradation (Jamal & Getz, 1995). Furthermore, to meet the contemporary sustainable tourism requirements, it is crucial to remember the compliance with and implementation of the SDGs. Established by the United Nations General Assembly in 2015, the 17 goals include aims to create "affordable and clean energy," "decent work and economic growth" and "sustainable cities and communities" among others (United Nations, 2017). In recent years, the interest in the implementation of SDGs is increasing. Governments and companies are still trying to focus their attention on specific dimensions of sustainability and the relationships between them.

In less developed countries, the tourism sector is characterized by infrastructural deficiencies, heavy foreign investment (and interest) and low skill levels. The tourism-generated linkages that are supposed to connect different actors and foster the development of the tourist destination are often weak and underutilized (Sharpley, 2002). The sustainable development of these areas thus becomes, on the one hand, a great opportunity to regenerate the region and promote the tourism offering, and, on the other, a great opportunity for the development of professional figures to increase marketing efforts regarding the territory and its peculiar and distinctive elements and knowledge related to the carrying capacity of the environment and the communities involved.

By community, we mean a group of people who live and interact within a specific geographical area. In the context of sustainability, a community can be a small rural settlement, a large metropolitan region or an entire nation. What makes an area a community is the shared interactions among the people living there (Hall and Richards, 2000). In this way, the re-appropriation of tourism activity by locals transforms communities and the territory from passive attractions to active subjects, not only economically but also in the decisions that affect the fruition and physical use of the territory, as well as the fruition of its identity aspects, customs, material culture, etc., trying to enhance it as much as possible without stereotypes and cultural asymmetries.

There are several dimensions that are positively influenced when sustainable tourism and development are implemented. These include the environmental, socio-cultural and economic influences of tourism. The environmental dimension of tourism includes its relationship with natural resources and historical and artistic heritage. The social dimension concerns the socio-cultural impact on the local population. The economic dimension concerns both the positive aspects of increased income and employment and negative aspects such as the diversion of resources from alternative uses (Swarbrooke, 1999). In terms of social sustainability, tourism poses the problem of the encounter between two cultures and two social models, namely that of the tourist and the resident, and the potential cultural differences between locals and tourists.

While there are positive impacts of tourism to developing nations, previous studies have also identified negative impacts of tourism on local communities across the dimensions. Although tourism has brought economic benefits, it has significantly contributed to environmental degradation, negative social and cultural impacts and habitat fragmentation. These undesirable side-effects have led to the growing concern for the conservation and preservation of natural resources, human well-being and the long-term economic viability of communities (Healy, 1994; Haralambopoulos & Pizam, 1996). Other negative effects lead to the overcrowding of facilities and services, as well as traffic congestion on roads; increase the availability of drugs, and the incidence of crime, prostitution and public alcoholism; and contribute toward worsening litter (Liu & Var, 1986; Matarrita-Cascante, Brennan, & Luloff, 2010; Park & Stokowski, 2009).

Moreover, from an environmental perspective, the negative potential impacts of tourism development include damage to the natural environment and increased air, water and other forms of environmental pollution (Ko & Stewart, 2002). The social dimension concerns the socio-cultural impact on the local population. In terms of social sustainability, tourism poses the problem of the encounter of two cultures and between two social models, namely that of the tourist and that of the resident, and the potential cultural differences between tourists and locals. The economic dimension concerns both the positive aspects of increased income and employment and the negative aspects such as the diversion of resources from alternative uses (Swarbrooke, 1999).

Research has begun to identify positive socio-cultural outcomes of sustainable tourism in Pakistan (Aman, Abbas, Mahmood, Nurunnabi, & Bano, 2019). Recently, the importance of information and communications technology and its positive influence on various economic

outcomes have been documented (Majeed & Ayub, 2018). Still other scholars have demonstrated that on a global scale, technology influences the tourism system with both positive, negative and ambivalent impacts on sustainability but that the potential for positive impacts make sustainable tourism a noteworthy endeavor (Gössling, 2017). Given that the goals of sustainable tourism in a developing region are to mitigate negative environmental and socio-cultural consequences and stimulate economic growth, the question then becomes how technology can (or cannot) aid in perceptions of sustainable tourism.

### *2.2 The role of technology in creating perceptions among Generation Z of tourism sustainability*

Technology is globally widespread, even in the poorest countries. However, the degree of diffusion and use differs across richer and poorer areas and range from first time users of devices and platforms to those who implement smart technology (i.e. artificial intelligence, cloud computing, IoT and mobile communication). The implementation and expansion of technology and ICT in the tourism industry have also had an impact on destinations, whose digital development process has led to the definition of “smart tourism destinations.” Jovicic (2019) defines a smart tourism destination as “a knowledge-based destination, where ICTs are used to provide a technological platform on which information and knowledge relating to tourism could be instantly exchanged.” Thus, to create a smart destination, it is necessary to have a technological infrastructure capable of enabling the creation and dissemination of knowledge in a digital environment (Biaggio & Del Chiappa, 2014).

Technology is a necessity for the development of destination tourism throughout the tourist’s journey whereby tourism stakeholders can instantly share and exchange information about tourism activity with others (Buhalis & Amaranggana, 2015). This technology-driven information exchange is even more important among digital natives, as are members of Generation Z. However, “smart tourism” and the requisite infrastructure needed to achieve this are far from being realized in less developed countries. For example, Ashley and Roe (2001) revealed that several African countries fail to promote tourism effectively or fail to establish the link between tourism and poverty reduction or both. A growing number of studies have realized that the expansion of tourism sectors can be devastating (Sahli & Nowak, 2007). Instead of smart tourism, these developing destinations have what is described as scattered digitalization. “Scattered digitalization” is the condition of destinations in which some digital infrastructures are present, knowledge is partially co-created and shared, and the collaboration between the public sector, operators, residents and tourists are developed in a discontinuous, non-integrated and non-linear way.

Nowadays, technology has had tremendous impacts in all industries and sectors, as well as specific businesses. Buhalis and O’Connor (2005) identified several impacts of technology changes in the tourism industry. Technology (e.g. Internet, network infrastructure, e-mail and e-commerce) brings benefits to locals because it can provide communication networks that permit to exchange information with stakeholders (Karanasios & Burgess, 2008), allowing for the creation of connection through social media and giving access to a wider market through the Internet (Tamilmani, Rana, Nunkoo, Raghavan, & Dwivedi, 2020; Nunkoo, Gursoy, & Dwivedi, 2020).

These impacts have implications for both developed and poor countries. Ogbu, Idris, and Ijagbemi (2011) analyzed how technology has been adapted for the course in tourism to sell tourism products directly online without the consumer necessarily visiting the place before making any choice. Similarly, Sadr (2013) examined the role of technology in the tourism industry in Iran. The author highlighted that the application of the Internet for marketing activities such as hotel and airplane reservations, and organization activities have had an important impact on the buying decision-making process. However, several authors

(Bajracharya, Too, & Khanjanasthiti, 2013; Dao, Langella, & Carbo, 2011; Melville, 2010; Watson, Boudreau, & Chen, 2010) have stated that the role of technology in sustainable tourism has not been extensively explored in the literature.

Furthermore, the attitudes and perceptions of technology as an operant and operand resource is different between different generations, with greater integration in Generation Z. A hallmark of this generation is their desire to appreciate things that are real and using technology to identify when and where to find those real experiences (Entina, Karabulatova, Kormishova, Ekaterinovskaya, & Troyanskaya, 2021). Notably, individuals from the Z Generation like to “meet real ordinary people, solve real difficulties and problems, observe real life and events” (Entina *et al.*, 2021, p. 141). Studies on Generation Z are still limited. One qualitative study found that sustainable tourism was not a prominent concern for this generation in terms of environmental issues above the ways in which they would impact the tourist’s experience (e.g. clean water), but confirmed that immersing in the authentic culture was prominent (Haddouche & Salomone, 2018). These scholars have called for further exploration of Generation Z and their perceptions and tourism experiences.

Accordingly, the following research contributes to extant knowledge in two ways. First, it examines the role of technology as a driver of sustainability perception. Second, it diverges from most past research on these topics by focusing on the Z Generation for whom digital media and technology plays a particularly crucial role. Additionally, Generation Z is important to consider as they comprise 52% of Pakistan’s population, they represent a more globalized age group, and there is conflicting information on the importance of sustainability and its overall perception among this group. As Pakistan is a country that boasts authentic and unique experiences and is a developing country, this study sought to identify the perceived attractiveness of the destination and then consider technology as well as the environmental, socio-cultural and economic dimensions of sustainable tourism for Generation Z. Thus, the following perception hypotheses were formulated:

- H1.* Generation Z has a positive perception of tourism development’s impact in poor regions.
- H1a.* Generation Z has a positive perception of tourism development’s impact on the environmental dimension.
- H1b.* Generation Z has a positive perception of tourism development’s impact on the socio-cultural dimension.
- H1c.* Generation Z has a positive perception of tourism development’s impact on the economic dimension.
- H1d.* Generation Z has a positive perception of tourism development’s impact on the technology dimension.

In addition to testing the hypotheses and given the dearth of studies on the subject, this research investigated the perception of sustainability and technology according to an elicitation technique called picture-sorting, to understand the associations between technology and sustainability through the perceptions of the Generation Z participants.

### **3. Methodology**

#### *3.1 The country search field*

Pakistan was chosen as the tourist destination for this research. In 2020, Pakistan was recognized as an emerging tourist destination to be discovered by popular magazines (e.g. Condé Nast, Forbes), focusing on its natural beauties, such as mountains, lakes, forests, beaches, deserts, on local communities and local tangible and intangible cultural heritage.

Pakistan's tourism sites are diversified, giving a wide range of options for different sorts of visitors. The nation features one of the world's oldest civilizations, several scenic beauty spots, the world's tallest mountains, numerous religious and historic sites, distinctive arts and crafts, and a rich culture and legacy. In addition, the country is home to several UNESCO world heritage sites, including the Archaeological Ruins at Mohenjo-daro, Buddhist Ruins of Takht-i-Bahi and Neighboring City Remains at Sahr-i-Bahlol, Fort and Shalamar Gardens in Lahore, Historical Monuments at Makli, Thatta, and Historical Monuments at Makli, Thatta, and Historical Monuments at Makli, Thatta, Rohtas Fort and Taxila. The safety and poor conditions of tourist life, both for international and domestic tourists, place Pakistan as a potential emerging tourist destination for pioneer tourists and adventure tourists primarily. There are no official reports on tourism in Pakistan, but the Pakistan Tourism Development Corporation (PTDC) states that tourism to be mostly domestic (about 80%), with almost 50 m tourists yearly.

Pakistan's strategic geographical position, economic potential, surface and a population of about 220.9 m inhabitants (Pakistan Bureau of Statistics, 2017) make it a country of great geopolitical importance. Pakistan's growing youth population offers both a demographic dividend and a problem in terms of providing enough services and jobs. The country's institutional and economic stability are shown to have repercussions at a global level. Pakistan is the fifth most populous country in the world, 36% of the population lives in urban areas (World Bank, 2020) and 51.7% of Pakistan's population are aged under 25 (Mundi, 2019). The Pakistani Generation Z is not dissimilar to their global peers: they use online communication channels such as social media (37 m people) (Ali, 2020; Jamal, 2020) especially apps such as Facebook, Instagram, Snapchat and TikTok, and Internet platforms, such as YouTube. Additionally, as a former British colony, a large part of the population speaks English. As in the rest of the world, the Pakistani Generation Z mainly uses mobile phones to connect to the Internet (GSMA, 2020) and expect fast speeds and easy connection.

Pakistan possesses significant strategic assets as well as growth possibilities. According to Wee (2019), Pakistan is ranked as one of the most relevant economies in the Asia-Pacific region. The country has a low-to-medium per capita income and presents a highly vulnerable economic structure with large pockets of poverty and pressing needs for economic and social development. Most of Pakistan's population is concentrated in rural areas and is traditionally employed in agriculture, the service sector and the textile industry, which accounts for 57% of exports and 18% of gross domestic product (GDP). Furthermore, Pakistan's ICT sector is growing more rapidly than other countries in South Asia. The Government of Pakistan Finance Division (2019) shows that Pakistan's information technology contributed to roughly 16% of the total GDP, the highest in South Asian countries. By comparison, India's and Sri Lanka's growth rates were 6 to 8% of their total GDPs, respectively. Additionally, mobile and broadband has seen significant progress. Cellular mobile subscribers (number of active SIMs) in Pakistan reached 182 m at the end of March 2021 compared to 167.3 m by the end of June 2020 showing an increase of 8.6% in nine months. Also, broadband subscribers reached to 100 m. The total broadband penetration in Pakistan stood at 47.6% in March 2021 registering an increase of about 19.7% from the end of March 2020 (Government of Pakistan Finance Division, 2021).

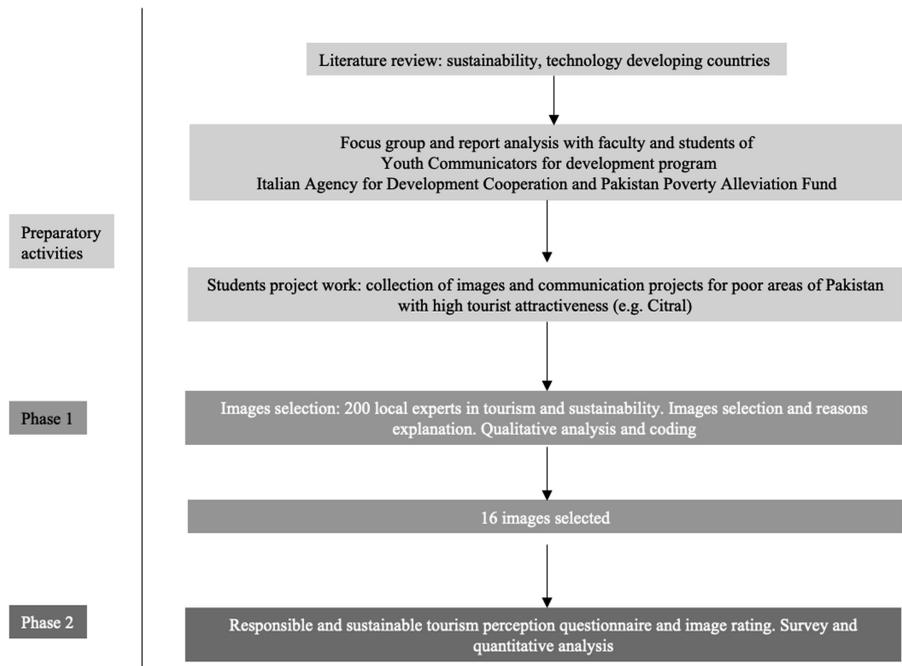
### 3.2 Research methodology

This study used a multi-method, multiphase embedded research design to better understand the complexities of the argument. Multiphase designs occur when a research team studies a topic through several related quantitative and qualitative investigations that are sequentially aligned, and new questions arise during the stages of the research project (Morse, 2003). This research design has been used in tourism studies previously. For example, Jiménez-Barreto, Rubio,

Campo and Molinillo's (2020) applied a multi-method approach to understand destination brand authenticity; Hunter and Suh's (2007) used it to investigate destination image perception, while Gallarza-Granizo, Ruiz-Molina and Schlosser (2019) have explored value dimensions in the hospitality industry. Previous research conducted in the Kaghan Valley (Pakistan) collected feedback from the local community to understand their perceptions of tourism and the problems caused by tourism in the territory and produced preliminary results using this approach (Arbolino, Boffardi, De Simone, & Ioppolo, 2021; Arif, Ullah, & Samad, 2019; Asmelash & Kumar, 2019). Accordingly, these mixed methods were deemed appropriate for the present study. The study process is depicted in Figure 1.

Preparatory activities included a literature review, focus groups and activities conducted in the *Sustainable tourism and natural and cultural heritage attractions training course* which was attended by 20 students from different universities in Pakistan's poor areas. The course was a main activity of the Youth Communication for Development program of the Italian Agency for Development Cooperation and Pakistan Poverty Alleviation Fund (PPAF), held in Islamabad, Pakistan in 2019. The students' project work was used to analyze four tourist regions (Citral, Swat Upper Dir and Balochistan) and collect the images used in phase 1.

**3.2.1 Phase 1.** In study phase 1, photographs were used to qualify the perceptions of sustainability and technology. A total of 16 pictures (8 pictures photographed directly on-site, and 8 pictures, selected from Facebook groups and Instagram profiles where tourists produce and share photos of destinations and experiences in the Pakistan region, and with at least 200 likes) were collected. The pictures were chosen to represent the varying degrees of perception for technology and sustainability dimensions. These include scenarios of high sustainability, such as natural and urban landscapes, and low sustainability, such as the presence of environmental degradation and pollution. In other pictures, we represent situations where



**Figure 1.**  
Research process  
methodology

technology is high, and others where it has declined on several degrees of development, such as ICT technologies presence (ATM, Wi-Fi, smartphones) or digital technologies presence (social media).

The pictures identified in this preliminary phase were reviewed by 200 local experts in tourism and sustainability from several Pakistani universities and pretested to validate the variety of case scenarios and local representativeness of the pictures shown. Based on the evidence from the experts, 8 pictures were considered for the analysis, based on the maximum and minimum average values in the dimensions of sustainability and technology, to prevent any response bias to emerge in the data collection. Each photo was associated with a related stimulus through a manual coding of the feedback derived from analysis of the expert's feedback to pictures (Saldaña, 2021). Then, the selected photos were used in the second phase of the research. The enumeration of the photos kept within the paper refers to the original numbering.

**3.2.2 Phase 2.** In study phase 2, a questionnaire was developed to measure the role of technology on Generation Z's sustainable tourism perception. A total of 865 responses were collected by distributing the online questionnaire through a link sent via e-mail and messaging apps. Respondents were Generation Z university students. The sampling was stratified by universities, distinguishing between poor and non-poor areas according to the Pakistan Poverty Alleviation Fund (PPAF) classification (<http://www.ppaf.org.pk/>). For the selected universities, the sampling was clustered randomly based on courses, and all students in those courses responded to the questionnaire.

The questionnaire consisted of two parts, with questions created based on previous studies of responsible and sustainable tourism (Arif *et al.*, 2019; Gong, Detchkhajornjaroensri, & Knight, 2018; Pérez *et al.*, 2017; Sánchez-Fernández, Iniesta-Bonillo, & Cervera-Taulet, 2019; Tasci, 2007). These scales were adopted due to the scope of the study, developed in Pakistan, and focused on studying tourists' perceptions in tourist areas.

Socio-demographic information of respondents was collected in the final part of the questionnaire. The participants were asked to indicate on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), the extent to which they agreed with a total of 35 attributes grouped in 5 dimensions: (1) environmental aspects, (2) social and cultural aspects, (3), economic aspects, (4) technology and (5) overall perception of tourism.

Additionally, the picture-sorting technique, an intuitive knowledge elicitation technique of visual social research, was used (Fincher & Tenenbergs, 2005). The purpose of this technique is to identify how subjects group and organize visual items. The answers reveal evaluations, mental categorization and information structure. The absence of verbalization and the quantitative evaluation represent a valuable method to understand a phenomenon that is difficult to verbalize, such as the associative impressions gained from pictures (Lobinger & Brantner, 2019). For this study, the *closed sort* method was used. Participants were asked to rank items according to the two predefined sorting categories. This technique is like ranking and rating scales used in surveys but in this case the items are non-rated individually, but in relation to each other. Participants were asked to rate the pictures selected in the second phase that represented two 7-point response scales depicting sustainability perception (1 = very unsustainable, 7 = very sustainable), and technology presence (1 = low technology (e.g. Wi-Fi, Internet) presence, 7 = high technology (e.g. Wi-Fi, Internet)) presence in the pictures displayed.

The evaluation was tailored without any mentioning of a specific destination in the image set, using a generic reference of "these touristic areas."

**3.2.3 Analyses.** The analysis of the results of the multiphase research was carried out in the following way: the elaboration of the questionnaire (phase 2) on the perception of sustainable tourism and technology through an exploratory factor analysis of the single items and dimensions and a multiple regression of the dimension indices. Finally, we analyze the

comparison of the answers according to the size of the city of residence (large, medium, and small cities and urban areas). The analysis was conducted on 200 experts in tourism and sustainability, allowing the selection of the pictures. The second part of the analysis was developed with the pictures-sorting techniques (close method) with photographs.

Qualitative analysis with manual coding (Saldaña, 2021) of the responses was carried out and a stimulus was associated with each photograph according to the degree of sustainability and technology present (high, medium, low or zero). The images without some description and georeferencing were submitted to the respondents (phase 2) according to the methods described in the methodology. Through a dispersion plot of the means of the evaluation of the photographs was constructed for the analysis of the relationship and through a cluster analysis, four groups of photographs were identified.

#### 4. Findings

Data were analyzed using the Statistical Package for the Social Sciences 10.0 (SPSS). The sample had a high prevalence of males (64.4%, this information is consistent with the student population of Pakistan), coming from small cities (43%) or medium-sized cities (29.8%) (see Table 1).

##### 4.1 Tourism sustainability perception scale

Exploratory factor analysis with principal component analysis was applied to each of 5 sets of measurement items to obtain fewer, meaningful, dimensions which summarize different perceptions of some relevant aspects concerning sustainability, tourism and technology. Factors with eigenvalues at least equal to 1 were kept; Cronbach's alpha values were used to

|                               |  | %    |
|-------------------------------|--|------|
| Gender                        | Female   | 35.6 |
|                               | Male   | 64.4 |
| Family income level per month | Less than Rs 20,000  | 30.8 |
|                               | Rs 20,001–40,000   | 20.5 |
|                               | Rs 40,001–60,000   | 24.9 |
|                               | Rs 60,001–80,000   | 16.4 |
|                               | Above Rs 80,000  | 7.5  |
| Size of city of residence     | Large cities (between 1 and 2 m inhabitants)                     | 12.4 |
|                               | Large metropolitan area (more than 10 m inhabitants)             | 5.5  |
|                               | Medium-sized cities (between 500,000 and 1 m inhabitants)        | 28.9 |
|                               | Medium-sized metropolitan area (between 2 to 10 m inhabitants)   | 10.2 |
|                               | Small cities (municipalities with less than 500,000 inhabitants) | 43.0 |
| PPAF classification           | Extreme poverty zone   | 23.4 |
|                               | High poverty zone  | 54.5 |
|                               | Low poverty zone   | 22.2 |
| Time spent browsing sites     | Less than 1 hour   | 13.1 |
|                               | 1–2 hours  | 25.4 |
|                               | 3–5 hours  | 42.0 |
|                               | 6–8 hours  | 13.9 |
|                               | More than 8 hours  | 5.1  |
| Time spent using social media | Less than 1 hour   | 13.8 |
|                               | 1–2 hours  | 36.6 |
|                               | 3–5 hours  | 29.4 |
|                               | 6–8 hours  | 12.7 |
|                               | More than 8 hours  | 7.5  |

**Table 1.**  
Sample  
characteristics  
( $n = 865$ )

| Dimension   | Loading             | Alpha            |
|---|---------------------|------------------|
| <i>Environmental dimension</i>                                  | <i>VAF = 76.43%</i> | <i>α = 0.938</i> |
| Promote positive relaxing atmosphere                            | 0.913               |                  |
| Protect the natural environment                                 | 0.910               |                  |
| Manage tourist seasonality                                      | 0.896               |                  |
| Protect natural landscape                                       | 0.864               |                  |
| Increase environmental awareness for touristic activities       | 0.832               |                  |
| Increases priority for environment concern                      | 0.827               |                  |
| <i>Socio-cultural dimension</i>                                 | <i>VAF = 70.88%</i> | <i>α = 0.959</i> |
| Promote culture of locals                                       | 0.881               |                  |
| Preserve trustworthy of locals                                  | 0.874               |                  |
| Develop historical and cultural activities                      | 0.865               |                  |
| Support cultural exchanges                                      | 0.858               |                  |
| Preserve the local food tradition                               | 0.856               |                  |
| Develop an overall life satisfaction                            | 0.838               |                  |
| Safety perception and security for local mobility               | 0.837               |                  |
| Support ethno demo, and anthropological heritage activities     | 0.829               |                  |
| Promote local shopping opportunities for manufacturing products | 0.825               |                  |
| Support participation in entertainments activities              | 0.810               |                  |
| Support local political stability                               | 0.783               |                  |
| <i>Economic dimension</i>                                       | <i>VAF = 71.80%</i> | <i>α = 0.950</i> |
| Increases facilities for touristic places                       | 0.876               |                  |
| Increase quality of food services business                      | 0.875               |                  |
| Increases local health well-being                               | 0.857               |                  |
| Increases technology affordability level                        | 0.851               |                  |
| Increases infrastructure affordability level                    | 0.850               |                  |
| Increase the quality of local hospitality services              | 0.846               |                  |
| Increases local safety well-being                               | 0.842               |                  |
| Promote local mobility opportunities                            | 0.824               |                  |
| Promote local hospitality opportunities for business            | 0.804               |                  |
| <i>Overall perception of tourism</i>                            | <i>VAF = 65.25%</i> | <i>α = 0.893</i> |
| Increases the income of locals                                  | 0.849               |                  |
| Preserve local tradition  | 0.842               |                  |
| Increase local government tax revenues                          | 0.835               |                  |
| Protect the community's culture                                 | 0.803               |                  |
| Produce short-term results                                      | 0.786               |                  |
| Protect the community's security                                | 0.726               |                  |
| <i>Technology dimension</i>                                     | <i>VAF = 75.45%</i> | <i>α = 0.919</i> |
| Increase travel booking opportunities using digital services    | 0.898               |                  |
| Increase attractiveness using digital services                  | 0.880               |                  |
| Promote tourism online opportunities                            | 0.867               |                  |
| Promote cultural heritage using digital communication           | 0.857               |                  |
| Facilitate mobility using technology infrastructure             | 0.840               |                  |

**Table 2.**  
Exploratory factor analysis

confirm the results of the factor analysis. Regression factor scores were calculated for each case (see Table 2).

The results showed that each set of items is very consistent: the first principal component, the only one with an eigenvalue greater than 1 has high and positive correlations with the original variables (loading >0.70) and the percentage of explained variance is greater than 65%. Consistent with this result, the internal consistency is confirmed by a high Cronbach's alpha coefficient  $\alpha > 0.89$ . Therefore, for each empiric dimension, the regression factor scores may be considered a synthetic index expressing the perceptions of respondents regarding the following aspects: environmental, socio-cultural, economic, technology and overall perception of tourism.

Next, multiple linear regression was used to predict respondents' overall perceptions of tourism based on the five synthetic indices. It included the environmental, socio-cultural, economic and technologic indices resulting from the exploratory factorial analysis described in the previous section. [Table 3](#) shows the regression coefficients and related results of the multiple linear regression. The total variance explained by the model was 61.6% ( $F(4, 850) = 340.75, p < 0.001$ ). Technology attitude was the strongest predictor ( $B = 0.554, p < 0.001$ ) followed by perceived economic aspects of tourism ( $B = 0.273, p < 0.001$ ).

To investigate whether different groups of respondents had significantly different perceptions of each factor, one-way analysis of variance (ANOVA) with Welch's test and a post hoc Games-Howell test (that do not assume equal variances) was performed using factor scores as dependent variables. Considering PPFA classification of the area of respondents, level of their technological competence, results show significant mean differences only for the environmental dimension, while there do not seem to be any significant differences (sig.  $>0.05$ ) for the other synthetic dimensions: in particular, respondents from the high poverty area appear to have lower scores than those from other ones. No significant difference in respondents' perceptions was found based on their levels of technology knowledge.

The key variable that seems to differ significantly from respondents' perceptions of all dimensions was the type of city of residence. In small and medium-sized cities, higher average values are observed on all dimensions also for the overall perception of negative tourism, considered as an element of socio-cultural disorder with a low impact on the local community poverty reduction. While in big cities these perceptions are lower, as shown in [Table 4](#) and [Figure 2](#). The results of the regression analysis demonstrate support for [H1](#), [H1a](#), [H1b](#), [H1c](#) and [H1d](#).

#### 4.2 Picture-sorting techniques: sustainability and technology in tourism

The simplification of the sustainable tourism paradigm, its theoretical rigidity and fragility has been the subject of debate among scholars for over 20 years (e.g. [Hunter, 1997](#); [Sharpley, 2020](#)). This issue becomes even more complex if we consider the one that involves the implementation of PPT strategies or community-based development (CBDM) models in developing countries. To contribute to the advancement of knowledge on the role of technology in Generation Z's perception of a developing country, the second phase of the research involved the use of photo analysis. The experts evaluated the 16 photographs that were submitted to them with a Likert scale evaluation from 1 to 7 and the open answer on the rationale of the evaluation, distinguished by technology and sustainability, for each score. At the end of the survey, the average of the scores and the standard deviation were calculated for each photograph, 8 photographs with a coefficient of variation (CV) higher than 60% were excluded because they are considered ambiguous. The independent manual codification of the comments for each photograph by the researcher team made it possible to classify the photographs according to the presence (yes or no) and the degree of relevance (high, medium,

**Table 3.**  
Multiple regression  
analysis: impact on  
overall perception of  
tourism

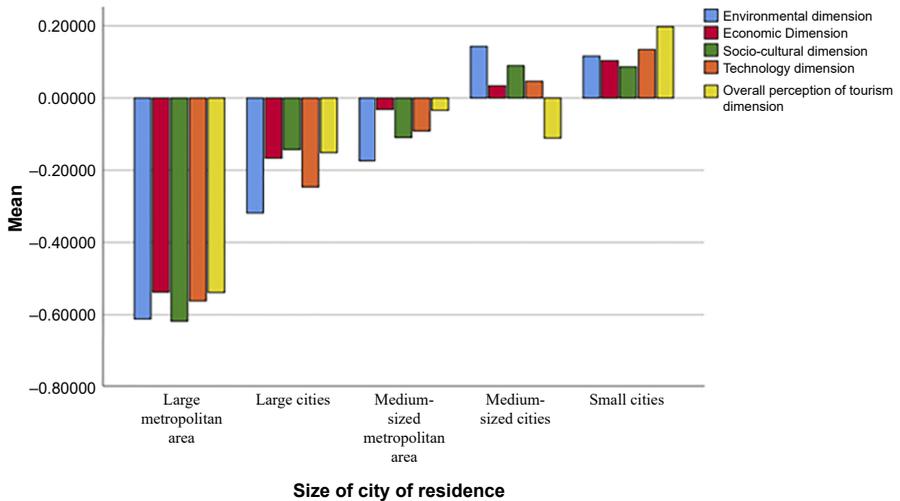
| Model                    | Standardized coefficients beta | t      | Sig   | F      | R <sup>2</sup> |
|--------------------------|--------------------------------|--------|-------|--------|----------------|
| (Constant)               |                                | 0      | 1     | 340.75 | 0.616          |
| Environmental dimension  | -0.012                         | -0.31  | 0.756 |        |                |
| Economic dimension       | 0.273                          | 7.319  | 0     |        |                |
| Socio-cultural dimension | 0.015                          | 0.333  | 0.739 |        |                |
| Technology dimension     | 0.554                          | 15.433 | 0     |        |                |

**Note(s):** <sup>a</sup>Dependent variable: overall perception of tourism dimension – adjusted R<sup>2</sup> = 0.614

| Dependent variable                      |   |  | Mean difference (I-J) | Std. Error | Sig   |
|---|---|--|-----------------------|------------|-------|
| Environmental dimension                 | Large metropolitan area (more than 10 million inhabitants)      | Medium-sized cities (between 500,000 and 1 million inhabitants)  | -0.7551481            | 0.197      | 0.003 |
|   |   | Small cities (municipalities with less than 500,000 inhabitants) | -0.72746079           | 0.194      | 0.004 |
|   | Large cities (between 1 and 2 million inhabitants)              | Medium-sized cities (between 500,000 and 1 million inhabitants)  | -0.46155529           | 0.120      | 0.002 |
|   |   | Small cities (municipalities with less than 500,000 inhabitants) | -0.43440127           | 0.114      | 0.002 |
|   |   | Large metropolitan area (more than 10 million inhabitants)       | -0.57082263           | 0.189      | 0.030 |
|   |   | Small cities (municipalities with less than 500,000 inhabitants) | -0.64044071           | 0.187      | 0.010 |
| Economic dimension                      | Large metropolitan area (more than 10 million inhabitants)      | Medium-sized cities (between 500,000 and 1 million inhabitants)  | -0.57082263           | 0.189      | 0.030 |
|   |   | Small cities (municipalities with less than 500,000 inhabitants) | -0.64044071           | 0.187      | 0.010 |
|   | Medium-sized cities (between 500,000 and 1 million inhabitants) | Large metropolitan area (more than 10 million inhabitants)       | 0.57082263            | 0.189      | 0.030 |
|   |   | Medium-sized cities (between 500,000 and 1 million inhabitants)  | -0.70796186           | 0.192      | 0.004 |
| Socio-cultural dimension                | Large metropolitan area (more than 10 million inhabitants)      | Small cities (municipalities with less than 500,000 inhabitants) | -0.70498050           | 0.188      | 0.004 |
|   |   | Medium-sized cities (between 500,000 and 1 million inhabitants)  | -0.60849481           | 0.191      | 0.019 |
|   | Large metropolitan area (more than 10 million inhabitants)      | Small cities (municipalities with less than 500,000 inhabitants) | -0.69664627           | 0.185      | 0.004 |
| Technology dimension                    | Large metropolitan area (more than 10 million inhabitants)      | Small cities (municipalities with less than 500,000 inhabitants) | -0.38099778           | 0.112      | 0.007 |
|   |   | Large cities (between 1 and 2 million inhabitants)               | -0.38099778           | 0.112      | 0.007 |
|   | Medium-sized cities (between 500,000 and 1 million inhabitants) | Large metropolitan area (more than 10 million inhabitants)       | 0.60849481            | 0.191      | 0.019 |
| Overall perception of tourism dimension | Large metropolitan area (more than 10 million inhabitants)      | Small cities (municipalities with less than 500,000 inhabitants) | -0.73614826           | 0.185      | 0.002 |
|   |   | Large cities (between 1 and 2 million inhabitants)               | -0.34861785           | 0.118      | 0.029 |
|   | Large metropolitan area (more than 10 million inhabitants)      | Small cities (municipalities with less than 500,000 inhabitants) | -0.34861785           | 0.118      | 0.029 |

Note(s): \*The mean difference is significant at the 0.05 level  
 \*\*The table shows only the significant differences

**Table 4.**  
 Dimensions by respondents' size of city means differences – multiple comparison



**Figure 2.**  
Dimensions means  
by respondents'  
size of city

low) of sustainability and technology; (i) to identify the stimulus of each photograph for the two dimensions detected. From the coding emerged the superimposition of three photographs on two same categories. With further coding of the responses for these photographs, the researchers selected the photos to be excluded, and 8 photographs were thus selected (Table 5).

From the analysis of the evaluations expressed by the respondents, it appears that the relationship between technology and sustainability evoked by the picture has a linear relationship for the participants. The scatterplot (Figure 3), representing the sample average values of sustainability and technology for each of the pictures, shows that there is a strong correlation ( $r = 0.963$ ) between the levels of technology and sustainability perceived by the respondents.

The analysis of the average responses of the photographs reported in the scatterplot allows to identify 4 clusters that combine photographs evocative of sustainability and technology (Figure 3):

*Cluster 1.* This cluster includes only photo 12. Respondents identified a low perception of sustainability and technology.

*Cluster 2:* In this cluster are grouped photo 7 and photo 5. The photos in this cluster show how in cases where technology is lacking, understood as infrastructure, within an area can cause lower sustainability than it might otherwise be.

*Cluster 3:* This cluster is the largest, and is defined by photo 1, photo 4, photo 8, photo 14 and photo 15. Technology is understood in this cluster concerning ICT tools that enable access to tourist destinations, at the infrastructure level and the level of online communication, for the economic support of both tourists and locals.

*Cluster 4:* In this cluster, only photo 10 has been considered. From the identification of this cluster, it emerges that respondents also identify as high-tech modern infrastructure, built to support tourist destinations while preserving the territory to which they are linked. This is, therefore, also to be understood as a form of high sustainability. Basically, a strong correlation emerges between the evaluation of technology and sustainability.

|    | Picture   | Stimuli  | Sustainability/technology | Description  |
|----|---|--|---------------------------|--|
| 1  |    | Presence of infrastructure services (ATMs) in natural areas          | Yes/Yes<br>Medium/High    | Highest ATM in the world<br>Source: Facebook group                                   |
| 4  |    | Presence of infrastructure services (mobile signal) in rural areas   | Yes/Yes<br>Medium/High    | Mobile signal tower within a small village during winter time<br>Source: Researchers |
| 5  |    | Contamination of rivers with waste                                   | Yes/No<br>Low/Low         | Waste on the riverside<br>Source: Facebook Group                                     |
| 7  |   | Lack of accessibility from an economic and environmental perspective | Yes/Yes<br>Medium/Low     | Dirt road in a rural area.<br>Source: Researchers                                    |
| 10 |  | High tourist mobility development                                    | Yes/Yes<br>High/High      | Newly built highway that runs beside the lake<br>Source: Facebook group              |

**Table 5.**  
Pictures used for the picture-sorting techniques

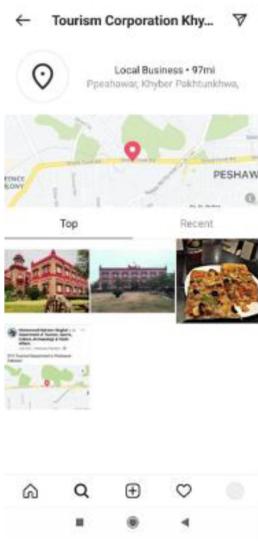
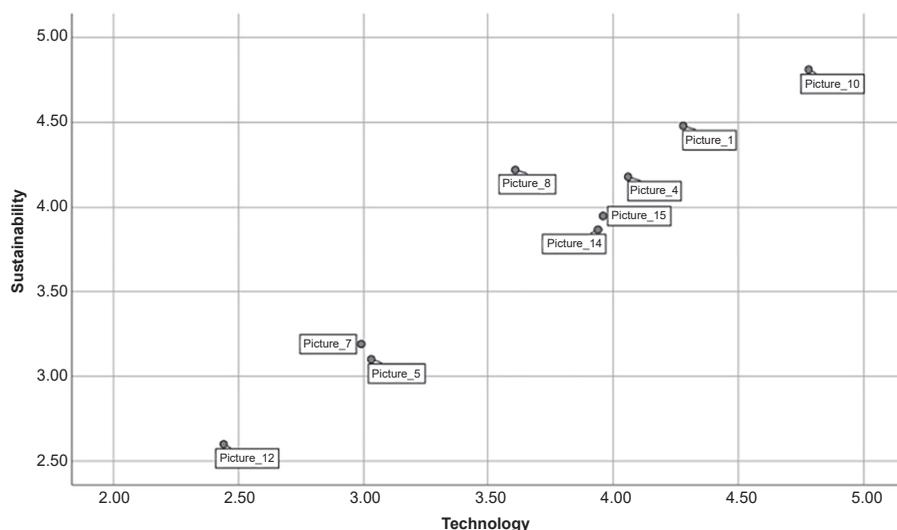
|    |   |  |                        |   |
|----|---|--|------------------------|---|
| 12 |    | Over-tourism impact  | Yes/No<br>Low/Low      | Waste on the banks of a river in a densely populated area<br>Source: Facebook Group             |
| 14 |    | Promoting environmental sustainability                             | Yes/Yes<br>Medium/High | Collection of photos for geolocation on Instagram for a local tourist town<br>Source: Instagram |
| 15 |  | Tech as operant for the diffusion of information with social media | Yes/Yes<br>High/High   | Instagram profile of a local tourist agency<br>Source: Instagram                                |

Table 5.



Source(s): Authors' elaboration

**Figure 3.** Relationship between technology and sustainability: sample average

Through the picture-sorting technique, we can detect the presence of mental associations for which technology is expressed in material terms, through infrastructures and networks. Particularly, relevant are the assessments of Figures 1 and 2. Photograph 12, which highlights a case of environmental degradation and pollution, was assessed with an average level of 2.5 out of 7 for sustainability and 2 out of 7 for technology. Similarly, photograph 10 was rated with an average between 4.5 and 5 for both sustainability and technology, interpreting the highway as an expression of technology and sustainability, with an average rating higher than, for example, the Instagram pages.

## 5. Discussion and implications

In the studies on sustainable tourism, the perception of sustainability of domestic tourists has gained considerable attention in tourism literature, according to different development approaches. But as said by Leiper (1979), “tourism is one of the principal ways through which our world-views are shaped”. There are as many ways to see, explain and interpret as there are myriad lenses through which to view “reality.” Different places inspire different representations in our minds. Each of us has his own geographical imaginations, and these are the result from a variety of factors – gender, age, education, ethnicity, culture, community attachment, environmental sustainability, economic stage and tourism development stage (Lee, 2013). Residents interpret and represent their experience differently from tourists (Allen & Massey, 1995). Research has focused on resident’s perception according to the model of four-dimension impact (economic, socio-cultural, environmental and life satisfaction) (Lee & Jan, 2019), overlooking the technology dimension (such as transportation and ICT) (Lama & Pradhan, 2020).

Technology and ICT are one of the pillars to achieving the SDGs of Agenda 2030. Our study contributes to the debate on the role of technology in tourists’ perceptions of sustainable tourism through multiphase research conducted on generation Z of different urban areas of poor regions of Pakistan. The survey on the perception of sustainable tourism has shown that technology is positively correlated with the other dimensions (environmental, socio-cultural and economic), and it seems that in smaller towns there is a more negative

perception of tourism on the local community and destination, both at the level of the individual dimension and in the overall perception of tourism.

According to the Travel and Tourism Competitive Index of [World Economic Forum \(2018\)](#), Pakistan has a poor competitiveness due to Safety and Security (134th out of 140), Health and hygiene (101), Human resources and labor condition (135) and ICT readiness (123), but at the same time it has a high price competitiveness (37 out of 140), Natural and cultural resources (87), Infrastructure (99) and Enabling environment (101). Several projects and activities have been implemented by the Pakistani government to address the multidimensional issues of poverty and tourism, and tourism is considered a priority activity for the opening and development of Pakistan. Among these there are also projects for sustainable tourism development, community based, as envisaged by the Government's tourism plan, also in collaboration with the international cooperation of Western countries, including AICS Italy, and the local Pakistan Poverty Alleviation Fund (PPAF) and Pakistan Tourism Development Cooperation (PDTC). Locals' involvement is therefore considered essential for Pakistan's sustainable tourism development and poverty alleviation. In this context, main destinations for domestic tourists are the Khyber Pass, Peshawar, Karachi, Lahore, Swat, Rawalpindi, Mohenjo-daro, Harappa and Taxila [Pakistan Tourism Development Corporation, Pakistan Government, 2020](#).

Furthermore, developing countries are those which, with respect to the objectives of the 2030 Agenda, have a significant weight because one of the main objectives is the reduction of inequality, support work and target economic growth. Tourism can reduce poverty is well known ([Scheyvens & Hughes, 2019](#)), so it is argued that sustainable tourism may be the key to doing so. As [Sharpley \(2020\)](#) states, the success of a tourist destination is measured by the number of arrivals, but these are in opposition to the numbers of sustainable tourism.

In the context of studies aimed at considering sustainable tourism in relation to poverty alleviation, this study shows that even for developing countries, where Generation Z represents about 30% of the population, technology is one of the dimensions that determine the perception of sustainability. However, as phase 1 explains with the experts' feedback collection, and phase 2, involving Generation Z in stimuli picture research, there is a positive linear relationship between the perception of sustainability and technology in the tourism sector. The traditional perspective of tourism sustainability perception studies has been enriched with new approaches and research. As demonstrated by [Font, English, Gkritzali and Tian \(2021\)](#), on perspectives of sustainable tourism development, the residents are development actors and beneficiaries, they are operant and operand resources.

### *5.1 Theoretical implications*

Past research into this topic has largely investigated sustainability perception, both from the point of view of residents and tourists ([Truong et al., 2014](#)), not addressing the technological dimension and its relationship with sustainability. There is no evidence of a structured construct of sustainable tourism development ([Sharpley, 2020](#)). There is also evidence that community tourism programs have improved the living conditions of the population that is considered poor in regional territories, using sustainable rural tourism as a dependent variable, alongside tourism activities that involve communities, including participation in decision-making, levels of knowledge about the tourism industry and empowerment ([Li, 2006](#)). Involving residents in tourism planning may provide the best method of developing tourism because residents are sensitive to the meanings and value of local natural and socio-cultural resources ([Zhang et al., 2020](#)). Tourism development and subsequent interactions with tourists directly affect local communities ([Sharpley, 1994](#)). These forces invariably alter the values, behaviors, lifestyles and quality of life of local community members ([Andereck, Valentine, Knopf, & Vogt, 2005; Hall & Page, 2014](#)).

---

Furthermore, from the analysis of the sustainable tourism dimensions, a different perception of the sustainability impact emerges deriving from the classification of residence of the interviewees, (e.g. the size of the city; rural vs urban). Members of Generation Z who live in rural areas or small towns appreciate less the positive effects of tourism and fear the negative effects, especially concerning the socio-cultural and environmental impact. It emerges that technology is correlated with the other variables of sustainability and that it is positively correlated, confirming its relevance as a resource for development. This opens the need for an in-depth study of the role of technology in developing countries' sustainable tourism development as an operand resource. Furthermore, the picture-sorting technique shows that for Generation Z technology and sustainability are strongly correlated. Given the assessments provided, this suggests that, although the assessments on tourism are positive in terms of opportunities, the degree of tolerance of sustainability must initially be measured. This means that when studies on sustainable development are carried out, including studies on the path dependence, they must start from the interpretation of sustainability by the residents, depending on the place of residents and by domestic tourists.

### *5.2 Managerial and public sector implications*

Despite the fact that 40 years have passed since initial concern was expressed regarding the impact of mass tourism, the constructs of sustainable tourism remain the subject of debate on both defining and theoretical foundations and practice (Sharpley, 2020). Nevertheless, data on global tourism still highlight that the success of a tourist destination is globally and synthetically measured on the basis of tourist arrivals and the income generated, the higher they are, the more that destination obtains positions in the main explanatory rankings of the sector (e.g. annual UNWTO classification of destinations based on international tourist arrivals and income). A paradox exists, therefore, between the axioms of sustainable tourism and the evaluation of tourism success, anchored to the high numbers of tourism.

The evaluation of these findings can be used to formulate proper policy planning such as (1) development of adequate management systems of the tourist hospitality offer, to prevent overcrowding in peak periods; (2) careful management of visitors flows and, where necessary, application of visitor use controls in natural and natural tourist attractions to avoid congestion and environmental deterioration of places and (3) activities to preserve and promote local traditions.

The Government in Pakistan can also work on sustainable tourism priorities to the priorities dictated by the 2030 Agenda based on impacts on the SDGs. These activities refer to several goals: for SDG 1 (No Poverty), the possibility of market access through digital technology offers rural territories in developing countries with potential tourism development the opportunity to create new jobs with a more equitable distribution of income also in favor of the poorer locals. Tourism in addition to being one of the main sources of export income is one of the main drivers of employment in many areas that, to be attractive, are normally also less industrialized. Economic growth is matched by a demand for new jobs that have arisen because of a digital transformation.

There are far more of them than one might imagine, and substantial investments are needed to support a training level that can meet this expectation. This refers to SDG 8 (Decent Work and Economic Growth). Similarly, from the findings of the study, technology, including infrastructure, has an impact on sustainable tourism, and is particularly important for members of Generation Z, who care about both. Investing in these activities would allow the country to respond to the principles of SDG 9 (Industry, Innovation and Infrastructure). Sustainable tourism could also reduce barriers to entry and enable the development of territories that have less money to support very expensive investments. Digital technology lowers costs and democratizes the market, making it more accessible to even the most

disadvantaged communities (SDG10: Reduced Inequality) and improving the inclusiveness of the local population (SDG 11: Sustainable Cities and Communities).

Ultimately, this study offers suggestions for governments of developing countries. First, Generation Z has sensitivity to sustainable tourism development and believes that tourism can improve the quality of life and can also have positive impacts on social sustainability and the environment (Guo, 2003). However, this general evaluation assumes different specific values (also negative) depending on the place of residence, identifying a greater perception of risk in rural areas and smaller inhabited centers. Second, in the application of its development policies within the path dependence model, technology is a development dimension (operant resource), and at the same time influences and improves the perception of sustainability (operand resource). Third, technology is mainly related to the infrastructural dimension and has a positive correlation with tourism and the dimensions of sustainability. In other words, technology can be used positively as a driver of communication aimed at raising awareness of the behavior of the locals and domestic tourists or involving locals in PPT models (Wu, 2012). Generation Z has shown interest in and a propensity toward using technology for sharing information and value about their tourism experiences in developing countries. Their attitude toward sustainable models has been demonstrated, and it is vital for the longevity of the developing countries which are implementing these technologies to be sensitive to how they are attracting younger generations and maintaining the integrity of their destinations.

### 5.3 Limitations and future research

This study was conducted by using students from several universities in Pakistan rather than a cross-section of the entire population, distinguishing them between locals and guests. This was useful in providing a consistent sample for this study. However, the opinions measured through these students might differ from those held by the general Pakistan population. Also, the sustainability perception could be due to a destination's economic, political and historical background, as well as characteristics such as age, gender, education, income and the lifestyle of the respondents. Further investigation into specific demographics and how they influence perceptions of technology and sustainable tourism warrants future research. As the purpose of this study was primarily to investigate the existence of a correlation between technology and sustainability perception among Generation Z, the relationship between technology and sustainability should be investigated in future studies among additional stakeholders in the tourism ecosystem such as hotels, service providers or public institutions in Pakistan. Furthermore, future studies could use both visual and verbal stimuli, and measure the differences between the groups comparing them against the results of this study. Similar studies should be conducted with groups culturally different from those used in this study.

### References

- Akaka, M. A., & Vargo, S. L. (2014). Technology as an operant resource in service (eco) systems. *Information Systems and E-Business Management*, 12(3), 367–384.
- Ali, A. and Frew, A. J. (2014). "ICT and sustainable tourism development: An innovative perspective", *Journal of Hospitality and Tourism Technology*, 5(1), pp. 2-16, doi: [10.1108/JHTT-12-2012-0034](https://doi.org/10.1108/JHTT-12-2012-0034).
- Ali, S. A. (2020). The effects of social media and youth in Pakistan. *Daily Blochistan Express*, February 26. Retrieved from <https://www.bexpress.com.pk/2019/12/theeffects-of-social-media-and-youth-in-pakistan/>.
- Allen, J., & Massey, D. B. (Eds) (1995). *Geographical worlds*. Milton Keynes: Open University.
- Aman, J., Abbas, J., Mahmood, S., Nurunnabi, M., & Bano, S. (2019). The influence of islamic religiosity on the perceived socio-cultural impact of sustainable tourism development in Pakistan: A structural equation modeling approach. *Sustainability*, 11(11), 3039.

- Andereck, K. L., Valentine, K. M., Knopf, R. C., & Vogt, C. A. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research*, 32(4), 1056–1076.
- Angelkova, T., Koteski, C., Jakovlev, Z., & Mitrevska, E. (2012). Sustainability and competitiveness of tourism. *Procedia-Social and Behavioral Sciences*, 44, 221–227.
- Arbolino, R., Boffardi, R., De Simone, L., & Ioppolo, G. (2021). Multi-objective optimization technique: A novel approach in tourism sustainability planning. *Journal of Environmental Management*, 285, 112–16.
- Arif, A. M., Ullah, S., & Samad, A. (2019). Problems caused by tourism in Kaghan Valley, Pakistan: A study based on local community perception. *Global Social Sciences Review (GSSR)*, IV(III (Summer 2019)), 284–291.
- Ashley, C., Boyd, C., & Goodwin, H. (2000). *Pro-poor tourism: Putting poverty at the heart of the tourism agenda*.
- Ashley, C. and Roe, D. (2001), *Pro-poor tourism strategies: Making tourism work for the poor: A review of experience*, Russell Press, Nottingham.
- Asmelash, A. G., & Kumar, S. (2019). Assessing progress of tourism sustainability: Developing and validating sustainability indicators. *Tourism Management*, 71, 67–83.
- Avcikurt, C., & Demirbulat, Ö. (2015). Tourist guides' attitude towards sustainable tourism. *Journal of Tourism Theory and Research*, 2(2), 122–134.
- Bajracharya, B., Too, L., & Khanjanasthiti, I. (2013). A framework for creating active and healthy communities: A case study of the Gold Coast. *Making Cities Liveable Conference: In Conjunction with the Sustainable Transformation Conference* (pp. 4–23). AST Management Pty Ltd.
- Biaggio, R., & Del Chiappa, G. (2014). Real and virtual relationships in tourism digital ecosystems. *Information Technology and Tourism*, 14(1), 3–19.
- Broadbent, E., Gougoulis, J., Lui, N., Pota, V., & Simons, J. (2017). *Generation Z: Global citizenship survey. What the world's young people think and feel*. Varkey Foundation. Available from: <https://www.varkeyfoundation.org/media/4487/global-young-peoplereport-single-pages-new.pdf>.
- Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalization of services. *Information and communication technologies in tourism 2015* (pp. 377–389). Cham: Springer.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the internet – the state of eTourism research. *Tourism Management*, 29(4), 609–623.
- Buhalis, D., & O'Connor, P. (2005). Information communication technology revolutionizing tourism. *Tourism Recreation Research*, 30(3), 7–16.
- Butzmann, E., & Job, H. (2017). Developing a typology of sustainable protected area tourism products. *Journal of Sustainable Tourism*, 25(12), 1736–1755.
- Chok, S., Macbeth, J., & Warren, C. (2007). Tourism as a tool for poverty alleviation: A critical analysis of 'pro-poor tourism' and implications for sustainability. *Current Issues in Tourism*, 10(2–3), 144–165.
- Corbisiero, F., & Ruspini, E. (2018). Millennials and generation Z: Challenges and future perspectives for international tourism. *Journal of Tourism Futures*, 4(1), 3–104.
- Dao, V., Langella, I., & Carbo, J. (2011). From green to sustainability: Information technology and an integrated sustainability framework. *The Journal of Strategic Information Systems*, 20(1), 63–79.
- Dimock, M. (2019), "Defining generations: where millennials end and generation Z begins", *Pew Research Center*, 17(1), pp. 1-7.
- Entina, T., Karabulatova, I., Kormishova, A., Ekaterinovskaya, M., & Troyanskaya, M. (2021). Tourism industry management in the global transformation: Meeting the needs of generation Z. *Polish Journal of Management Studies*, 23(2), 130–148.
- Fennell, D.A. (2020), "Technology and the sustainable tourist in the new age of disruption", *Journal of Sustainable Tourism*, 29(5), pp. 767-773.

- Fincher, S., & Tenenberg, J. (2005). Making sense of card sorting data. *Expert Systems*, 22(3), 89–93.
- Font, X., English, R., Gkritzali, A., & Tian, W. S. (2021). Value co-creation in sustainable tourism: A service-dominant logic approach. *Tourism Management*, 82, 104200.
- Gallarza-Granizo, M. G., Ruiz-Molina, M. E., & Schlosser, C. (2019). Customer value in quick-service restaurants: A cross-cultural study. *International Journal of Hospitality Management*, 85, 102351.
- Gardiner, S., Grace, D., & King, C. (2014). The generation effect: The future of domestic tourism in Australia. *Journal of Travel Research*, 53(6), 705–720.
- Gössling, S. (2017). Tourism, information technologies and sustainability: An exploratory review. *Journal of Sustainable Tourism*, 25(7), 1024–1041.
- Goffi, G., Cucculelli, M., & Masiero, L. (2019). Fostering tourism destination competitiveness in developing countries: The role of sustainability. *Journal of Cleaner Production*, 209, 101–115. doi: [10.1016/j.jclepro.2018.10.208](https://doi.org/10.1016/j.jclepro.2018.10.208).
- Gong, J., Detchkhajornjaroensri, P., & Knight, D. W. (2018). Responsible tourism in Bangkok, Thailand: Resident perceptions of Chinese tourist behaviour. *International Journal of Tourism Research*, 21(2), 221–233.
- Government of Pakistan Finance Division (2019), “Pakistan Economic Survey 2018-2019”, available at: [https://www.finance.gov.pk/survey\\_1819.html](https://www.finance.gov.pk/survey_1819.html) (accessed 3 April 2022).
- Government of Pakistan Finance Division (2021), “Pakistan Economic Survey 2020-2021”, available at: [https://www.finance.gov.pk/survey\\_2021.html](https://www.finance.gov.pk/survey_2021.html) (accessed 3 April 2022).
- GSMA (2020), “Pakistan towards a fully fledged digital economy”, available at: <https://www.gsma.com/asia-pacific/wp-content/uploads/2020/06/24253-Pakistan-report-updates-LR.pdf> (accessed 7 May 2022).
- Guo, L. F. (2003). Path dependence and the development of county tourism economy. *Issues in Agricultural Economy*, 12, 41–44.
- Haddouche, H. and Salomone, C. (2018), “Generation Z and the tourist experience: Tourist stories and use of social networks”, *Journal of Tourism Futures*, 4(1), pp. 69-79, doi: [10.1108/JTF-12-2017-0059](https://doi.org/10.1108/JTF-12-2017-0059).
- Hall, C. M. and Page, S. J. (2014), *The geography of tourism and recreation: Environment, place and space*, Routledge, London.
- Hall, D. and Richards, G. (2000), “The community: A sustainable concept in tourism development”, *Tourism and Sustainable Community Development*, 12, pp. 48-59.
- Haralambopoulos, N., & Pizam, A. (1996). Perceived impacts of tourism: The case of Samos. *Annals of Tourism Research*, 23(3), 503–526.
- Healy, R. G. (1994). The “common pool” problem in tourism landscapes. *Annals of Tourism Research*, 21(3), 596–611.
- Hunter, C. (1997), “Sustainable tourism as an adaptive paradigm”, *Annals of Tourism Research*, 24(4), pp. 850-867.
- Hunter, W. C., & Suh, Y. K. (2007). Multimethod research on destination image perception: Jeju standing stones. *Tourism Management*, 28(1), 130–139.
- Imran, M., Khan, K.B., Zaman, K., Musah, M.B., Sudiapermana, E., Aziz, A.R.A., Embong, R., Hassan, Bin, Z., Jabor, M.K. and Anis, S.N.M. (2021), “Achieving pro-poor growth and environmental sustainability agenda through information technologies: as right as rain”, *Environmental Science and Pollution Research*, 28(30), pp. 41000-41015.
- Jamal, A. (2020), “Generation Z in Pakistan: Individualistic and collectivist in orientation”, *The New Generation Z in Asia: Dynamics, differences, digitalisation*, Emerald Publishing, pp. 105-117. doi: [10.1108/978-1-80043-220-820201011](https://doi.org/10.1108/978-1-80043-220-820201011).
- Jamal, T. B., & Getz, D. (1995). Collaboration theory and community tourism planning. *Annals of Tourism Research*, 22(1), 186–204.

- Jiménez-Barreto, J., Rubio, N., Campo, S., & Molinillo, S. (2020). Linking the online destination brand experience and brand credibility with tourists' behavioral intentions toward a destination. *Tourism Management*, 79, 104101.
- Johnson, A. G. (2022). "Why are smart destinations not all technology-oriented? Examining the development of smart tourism initiatives based on path dependence", *Current Issues in Tourism*, pp. 1-13, doi: [10.1080/13683500.2022.2053071](https://doi.org/10.1080/13683500.2022.2053071).
- Jovicic, D. Z. (2019). From the traditional understanding of tourism to the smart tourism destination. *Current Issues in Tourism*, 22(3), 276–282.
- Karanasios, S., & Burgess, S. (2008). Tourism and internet adoption: A developing world perspective. *International Journal of Tourism Research*, 10(2), 169–182.
- Kaypak, Ş. (2010). Sustainability of ecological tourism. *International Journal of Alanya Faculty of Business*, 2(2), 93–114.
- Ko, D. W., & Stewart, W. P. (2002). A structural equation model of residents' attitudes for tourism development. *Tourism Management*, 23(5), 521–530.
- Lama, S., & Pradhan, S. Dr (2020). "ICT in sustainable tourism: a systematic review", *ACIS 2020 Proceedings*, Vol. 17, pp. 1-11.
- Lee, T.H. (2013). "Influence analysis of community resident support for sustainable tourism development", *Tourism Management*, 34, pp. 37-46, doi: [10.1016/j.tourman.2012.03.007](https://doi.org/10.1016/j.tourman.2012.03.007).
- Lee, T. H., & Jan, F. H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management*, 70, 368–380.
- Leiper, N. (1979). The framework of tourism: Towards a definition of tourism, tourist, and the tourist industry. *Annals of Tourism Research*, 6(4), 390–407.
- Li, W. (2006). Community decision making participation in development. *Annals of Tourism Research*, 33(1), 132–143.
- Liu, J. C., & Var, T. (1986). Resident attitudes toward tourism impacts in Hawaii. *Annals of Tourism Research*, 13(2), 193–214.
- Liu, Y. and Yu, J. (2022). "Path dependence in pro-poor tourism", *Environment, Development and Sustainability*, 24(1), pp. 973-993.
- Lobinger, K., & Brantner, C. (2019). Picture-sorting techniques: Card sorting and Q-sort as alternative and complementary approaches in visual social research. *The Sage handbook of visual research methods* (2nd Revised and Expanded Edition, pp. 309–321).
- Lusch, R. F., & Nambisan, S. (2015). Service innovation. *MIS Quarterly*, 39(1), 155–176.
- Majeed, M. T., & Ayub, T. (2018). Information and communication technology (ICT) and economic growth nexus: A comparative global analysis. *Pakistan Journal of Commerce and Social Sciences*, 12(2), 443–476.
- Mannhiem, K. (1952). *Essays on the sociology of knowledge*. London: Routledge.
- Matarrita-Cascante, D., Brennan, M. A., & Luloff, A. E. (2010). Community agency and sustainable tourism development: The case of La Fortuna, Costa Rica. *Journal of Sustainable Tourism*, 18(6), 735–756.
- Melville, N. P. (2010). "Information systems innovation for environmental sustainability", *MIS Quarterly*, 31(1), pp. 1-21.
- Morse, J. M. (2003). Principles of mixed methods and multimethod research design. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 189–208). Thousand Oaks, CA: Sage.
- Mundi, I. (2019). "Gini Index (World Bank Estimate): country ranking".
- Naidoo, R. and Fisher, B. (2020). "Reset sustainable development goals for a pandemic world", *Nature*, 583, pp. 198-201.
- Nunkoo, R., Gursoy, D. and Dwivedi, Y. K. (2020). "Effects of social media on residents' attitudes to tourism: Conceptual framework and research propositions", *Journal of Sustainable Tourism*, pp. 1-17, doi: [10.1080/09669582.2020.1845710](https://doi.org/10.1080/09669582.2020.1845710).

- Ogbu, S., Idris, S., & Ijagbemi, A. B. (2011). Information and communication technology (ICT): A veritable tool for tourism development in Nigeria. *Nigeria Computer Society (NCS): 10th International Conference* (pp. 25–29).
- Pakistan Bureau of Statistics (2017). *Provisional summary results of 6th population and housing census 2017*. Islamabad. Available from: <http://www.pbscensus.gov.pk/>.
- Pakistan Tourism Development Corporation, Pakistan Government (2020), Available from: <https://tourism.gov.pk/pakistan.html> (accessed 14 February 2022).
- Park, M., & Stokowski, P. A. (2009). Social disruption theory and crime in rural communities: Comparisons across three levels of tourism growth. *Tourism Management*, 30(6), 905–915.
- Pérez, V. E., Santoyo, A. H., Guerrero, F., León, M. A., da Silva, C. L., & Caballero, R. (2017). Measuring the sustainability of Cuban tourism destinations considering stakeholders' perceptions. *International Journal of Tourism Research*, 19(3), 318–328.
- Rogler, L. H. (2002). Historical generations and psychology: The case of the great depression and world war II. *American Psychologist*, 57(12), 1013–1023.
- Sánchez-Fernández, R., Iniesta-Bonillo, M. Á., & Cervera-Taulet, A. (2019). Exploring the concept of perceived sustainability at tourist destinations: A market segmentation approach. *Journal of Travel and Tourism Marketing*, 36(2), 176–190.
- Saayman, M., & Giampiccoli, A. (2016). Community-based and pro-poor tourism: Initial assessment of their relation to community development. *European Journal of Tourism Research*, 12, 145–190.
- Sadr, S. M. H. (2013). The role of ICT in the tourism industry on economic growth: Case study of Iran. *European Journal of Business and Management*, 5(17), 159–165.
- Sahli, M., & Nowak, J. J. (2007). Does inbound tourism benefit developing countries? A trade theoretic approach. *Journal of Travel Research*, 45(4), 426–434.
- Saldaña, J. (2021). *The coding manual for qualitative researchers*. SAGE Publications.
- Scheyvens, R., & Hughes, E. (2019). Can tourism help to “end poverty in all its forms everywhere”? The challenge of tourism addressing SDG1. *Journal of Sustainable Tourism*, 27(7), 1061–1079.
- Sharpley, R. (1994), *Tourism, Tourists and Society*, Elm Publications, Huntingdon.
- Sharpley, R. (2002), “Rural tourism and the challenge of tourism diversification: the case of Cyprus”, *Tourism Management*, 23(3), pp. 233-244.
- Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide: 20 years on. *Journal of Sustainable Tourism*, 28(11), 1935–1946.
- Singh, A. (2014). Challenges and issues of generation Z. *IOSR Journal of Business and Management*, 16(7), 59–63.
- Skinner, H., Sarpong, D., & White, G. R. T. (2018). Meeting the needs of the millennials and generation Z: Gamification in tourism through geocaching. *Journal of Tourism Futures*, 4(1), 93–104.
- Streimikiene, D., Svagzdiene, B., Jasinskas, E. and Simanavicius, A. (2021), “Sustainable tourism development and competitiveness: the systematic literature review”, *Sustainable Development*, 29(1), pp. 259-271.
- Swarbrooke, J. (1999), *Sustainable tourism management*, Cabi Publishing, Wallingford.
- Sydow, J., Windeler, A., Muller-Seitz, G., & Lange, K. (2012). Path constitution analysis: A methodology for understanding path dependence and path creation. *Business Research Journal of VHB*, 5(2), 155–176. doi: [10.1007/BF03342736](https://doi.org/10.1007/BF03342736).
- Tamilmani, K., Rana, N. P., Nunkoo, R., Raghavan, V. and Dwivedi, Y. K. (2020), “Indian travellers' adoption of Airbnb platform”, *Information Systems Frontiers*, 24(2), pp. 1-20, doi: [10.1007/s10796-020-10060-1](https://doi.org/10.1007/s10796-020-10060-1).
- Tasci, A. D., & Severt, D. (2007). A triple lens measurement of host–guest perceptions for sustainable gaze in tourism. *Journal of Sustainable Tourism*, 25(6), 711–731.

- 
- Truong, V.D., Hall, C.M. and Garry, T. (2014), "Tourism and poverty alleviation: perceptions and experiences of poor people in Sapa, Vietnam", *Journal of Sustainable Tourism*, 22(7), pp. 1071-1089.
- Turner, A. (2015). Generation Z: Technology and social interest. *The Journal of Individual Psychology*, 71(2), 103–113.
- United Nations (2017), "Sustainable development goals 2030", available at: [https://www.undp.org/sustainable-development-goals?utm\\_source=EN&utm\\_medium=GSR&utm\\_content=US\\_UNDP\\_PaidSearch\\_Brand\\_English&utm\\_campaign=CENTRAL&c\\_src=CENTRAL&c\\_src2=GSR&gclid=Cj0KCQjwnNyUBhCZARIsAI9AYIHb6LcJRao\\_sgCAki-jlDSd4mJJN-7qMIFS6U84L4DND1ymxvv09DAaAnANEALw\\_wcB](https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjwnNyUBhCZARIsAI9AYIHb6LcJRao_sgCAki-jlDSd4mJJN-7qMIFS6U84L4DND1ymxvv09DAaAnANEALw_wcB) (accessed 7 May 2022).
- United Nations (2020), "Impact of Covid-19 on the sustainable development goals", available at: [https://sdgintegration.undp.org/accelerating-development-progressduring-covid-19?utm\\_source=EN&utm\\_medium=GSR&utm\\_content=US\\_UNDP\\_PaidSearch\\_Brand\\_English&utm\\_campaign=CENTRAL&c\\_src=CENTRAL&c\\_src2=GSR&gclid=Cj0KCQjwnNyUBhCZARIsAI9AYIH9CduDuu6cCvoBPHuMOY6sKoGVFUVv2nJwVZp4xQXGf6WfjgW3wagaAvXwEALw\\_wcB](https://sdgintegration.undp.org/accelerating-development-progressduring-covid-19?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjwnNyUBhCZARIsAI9AYIH9CduDuu6cCvoBPHuMOY6sKoGVFUVv2nJwVZp4xQXGf6WfjgW3wagaAvXwEALw_wcB) (accessed 23 May 2022).
- UNWTO (2022), "Tourism enjoys strong start to 2022 while facing new uncertainties", available at: <https://www.unwto.org/news/tourism-enjoys-strong-start-to-2022-while-facing-new-uncertainties> (accessed 23 May 2022).
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10.
- Watson, R. T., Boudreau, M. C. and Chen, A. J. (2010), "Information systems and environmentally sustainable development: Energy informatics and new directions for the IS community", *MIS Quarterly*, 34(1), pp. 23-38, doi: 10.2307/20721413.
- Wee, D. (2019), "Generation Z talking: Transformative experience in educational travel", *Journal of Tourism Futures*, 5(2), pp. 157-167, doi: 10.1108/JTF-02-2019-0019.
- Winter, T. and Kim, S. (2021), "Exploring the relationship between tourism and poverty using the capability approach", *Journal of Sustainable Tourism*, 29(10), pp. 1655-1673, doi: 10.1080/09669582.2020.1865385.
- Wood, S. (2013). Generation Z as consumers: Trends and innovation. *Institute for Emerging Issues: NC State University*, 119(9), 7767–7779.
- World Bank (2020). World Bank East Asia and Pacific economic update, Spring 2020: Preparedness and vulnerabilities/global reverberations of COVID-19. Available from: <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=PK>.
- World Economic Forum (2018). The global gender gap report 2020. Available from: [http://www3.weforum.org/docs/WEF\\_GGGR\\_2020.pdf](http://www3.weforum.org/docs/WEF_GGGR_2020.pdf).
- Wu, J. (2012). Path dependence, creation and break in the county tourism evolution – A case study of Chunan county in Zhejiang province. *Journal of Business Economics*, 247(5), 57–63.
- Zhang, Y., Xiao, X., Zheng, C., Xue, L., Guo, Y. and Wu, Q. (2020), "Is tourism participation in protected areas the best livelihood strategy from the perspective of community development and environmental protection?", *Journal of Sustainable Tourism*, 28(4), pp. 587-605.

### Corresponding author

Lisa Nicole Cain can be contacted at: [lcain@fiu.edu](mailto:lcain@fiu.edu)

---

For instructions on how to order reprints of this article, please visit our website:

[www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)

Or contact us for further details: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)