Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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On the post-pandemic travel boom: How capacity building and smart tourism technologies in rural areas can help - evidence from Iran

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ABSTRACT

While there have been numerous studies investigating the impact of the COVID-19 pandemic on tourism, few research projects have examined the impact of the outbreak on using smart tourism technologies (STT), especially in developing countries. This study adopted thematic analysis, with data collected using in-person interviews. The participants for the study were selected using the snow-balling technique. We explored the process of developing smart technologies during the pandemic and its impact on smart rural tourism technology development upon travel restart. The subject was investigated by focusing on five selected villages in central Iran which have tourism dependent economies. Overall, the results indicated that the pandemic partially changed the government's resistance towards the fast development of smart technologies. Thus, the role of smart technologies in curbing the virus spread was officially recognized. This change of policy led to the implementation of Capacity Building (CB) programs to improve digital literacy and minimize the digital gap that exists between urban and rural areas in Iran. Implementing CB programs during the pandemic directly and indirectly contributed to the digitalization of rural tourism. Implementing such programs enhanced tourism stakeholders' individual and institutional capacity to gain access to and creatively use STT in rural area. The results of this study improve our understanding and knowledge of the impact of crises on the degree of acceptability and use of STT in traditional rural societies.

1. Introduction

COVID-19 is one of the most impactful and widespread pandemics in modern times (Allam, 2020; Kim et al., 2022; Sharifi and Khavarian-Garmsir, 2020). Given that the pandemic negatively affected all aspects of people's lives across the world, governments were forced to impose extensive restrictions to control and reduce the rate of infection (Gössling et al., 2020; Gössling and Schweiggart, 2022). These restrictions resulted in numerous challenges to people in their everyday life (Kock et al., 2020; Rickly, 2022), with some of these restrictions are still being felt at the time of writing. As a result, unique innovations emerged in order to mitigate the adverse impacts of these restrictions (Allam and Jones, 2020; Vaishar and Šťastná, 2022). A good example of this is the creative use of smart technologies However, the capacity and facilities that are available to utilize smart technology vary from region to region within developing countries (Sharifi and Khavarian-Garmsir, 2020). There has always been a Digital Gap between urban and rural areas in developing countries. However, this gap has become more evident as a consequence of the pandemic and, as a result, the distinction between these two settings has become more pronounced (Gössling et al., 2020). Thus, governments' attention was often directed at poor infrastructure and lack of enough digital skills in rural areas (Davies,

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2021). Therefore, at the peak of the pandemic, governments began to make significant investments in enhancing information and communication technology (ICT) infrastructure and empowering citizens in rural regions to facilitate access to smart technologies. This was done with the objective of providing essential services such as e-learning and facilitating remote work (Esteban et al., 2020). A sizeable issue hindering the digitalization of tourism in rural areas of developing countries is the lack of adequate ICT infrastructure, as well as a lack of sufficient skills among stakeholders to use technologies related to smart tourism (Nchake and Shuaibu, 2022; Salemink et al., 2017). However, as the pandemic restrictions decline and travel resumes, we will see a measurable increase in the use of technologies in rural businesses, especially in the tourism sector, because of the improvements in infrastructure and people's digital skills that have taken place during the pandemic (Ghaderi et al., 2022a; Vaishar and Šťastná, 2022).

As a result of urbanization and development in developing countries, rural areas have become popular tourist destinations for those who are interested in nature and rural culture (Torabi et al., 2019). Tourism attractions in rural areas have typically been managed using traditional methods, with smart technology playing a minimal role in meeting consumer needs (Shafiee et al., 2022). In general, two major problems hamper the process of developing and using ICT and smart technologies in rural areas in developing countries (Martínez-Puche et al., 2022). First, relatively little public and private investment is made in such regions, hence their poorer ICT infrastructure in comparison with urban regions (Nchake and Shuaibu, 2022; Zhu and Shang, 2021). The second challenge has to do with the limited individual and institutional capacity in using and developing STT in rural destinations. At the individual level, many stakeholders do not possess the necessary knowledge and skills to exploit the potentials of STT (Ghaderi et al., 2018; Zhu et al., 2022). At the institutional level, national and local institutions also often do not have the required transparent rules, motivation, human capital, physical, and intellectual resources (Torabi et al., 2021), and internal/external organizational coherence to promote such technologies (Aruleba and Jere, 2022).

Developing STT in rural area therefore requires large-scale investment (Martínez-Puche et al., 2022). However, under normal conditions, it is difficult to convince the public and private sectors to invest in promoting rural tourism technologies (Nchake and Shuaibu, 2022), although crises can change governments' general policies, making them take fast steps to develop rural areas (Zhu and Shang, 2021). In this regard, it appears that the COVID-19 pandemic had caused a notable shift in government approaches, pushing them to support rural groups, in the bid to recoup economic loss (Davies, 2021). A unique opportunity for rural tourism in developing countries has been created as a result of the pandemic crisis to overcome past inadequacies and deficiencies, and narrow the digital gap between them and their urban areas, and to be 'smarter' than they were in the pre-pandemic period (Aruleba and Jere, 2022; Esteban et al., 2020).

Iran is among the countries recording a high infection and death rate connected to the COVID-19 outbreak (Ghaderi et al., 2022a). Based on the statistics released by Iran's Ministry of Health and Medical Education, over 7 million citizens contracted the virus and more than 140,000 people died (*Report of covid-19 in Iran*, 2022). During the pandemic and prior to the completion of the national vaccination project, extensive and unprecedented restrictions were applied to control the pandemic and observe social distancing (Komasi et al., 2022). At the same time, attempts were made to exploit smart technologies to minimize the problems associated with the restrictions, which affected school and university students as well as citizens' shopping and communication with friends and relatives (Khavarian-Garmsir et al., 2021). In urban areas, it was rather easy to deploy smart technologies given that people were relatively familiar with them (Gaved et al., 2015; Sharifi and Khavarian-Garmsir, 2020). Although there have been some successes in rural areas with the promotion of smart technology, there are still many challenges due to geographical isolation, poor infrastructure, and the lack of familiarity and access to ICT technologies among rural residents (Ghaderi et al., 2022a; Karamidehkordi et al., 2022). Therefore, Iran's government was obliged to implement unprecedented CB programs with the aim of deploying smart technologies in rural areas (*Smartening of rural destinations*, 2020). Implementing CB programs to enhance digital literacy in rural regions helps to improve the knowledge, attitude, and individual skills of stakeholders in the tourism industry through formal and informal training (Creese et al., 2020; Flores and da Costa, 2018). It is thus assumed that running such programs directly and indirectly enables stakeholders to meet their own needs more easily through using smart technologies (Doshmangir et al., 2022). Implementing these programs can also improve human, physical, and intellectual resources as well as the internal and external coherence of institutions associated with tourism. It may also enhance such institutions' motivation to develop STT in rural area (Esteban et al., 2020; Maquera et al., 2022).

In this study, two primary objectives are examined. First, we aim to investigate the impact of the COVID-19 pandemic on rural regions as well as community-based programs on the digitalization of rural communities. Secondly, we will examine the impact of digitalization on the development of smart rural tourism following the resumption of widespread travel. Accordingly, this study utilizes a qualitative research design in order to gain insights into the perspectives and experiences of stakeholders regarding these research objectives.

2. Literature

The advancement of smart technologies in rural areas plays a pivotal role in the promotion of STT in rural areas (Zhu and Shang, 2021). The concept of STT in rural areas can be defined as one that encompasses the application of basic and sophisticated technologies as well as digital solutions to enhance the tourism experience of various stakeholders in rural areas. This may include offering up-to-date information about local products such as healthcare facilities, attractions, and other relevant details. In fact, the development of STT in rural area is contingent upon the initial smartening of villages. Extant literature has demonstrated that the establishment of Information and Communication Technology (ICT) infrastructure in rural areas can invigorate the tourism sector and facilitate the digitalization of the tourism industry (Zafar et al., 2022; Zhu et al., 2022). The present study aims to investigate the process of developing smart villages during the COVID-19 pandemic and subsequently explore the role of smart tourism in the post-pandemic period. To provide a comprehensive overview, a review of the pertinent literature on both topics is presented.

Smart villages have gained a considerable amount of attention in recent years, focusing on improving rural quality of life and promoting sustainable development. The integration of ICT and the adoption of innovative solutions to address social, economic, and environmental issues are characteristics of smart villages (Caragliu et al., 2011). Developing a smart village is a complex and multifaceted process that requires the collaboration of various stakeholders, including policymakers, technology providers, and local residents. Importantly, Stojanova et al. (2021) suggest that smart village initiatives can improve service accessibility, boost productivity, and increase resilience to external shocks.

The adoption of digital technologies, in the context of smart tourism, has been widely acknowledged as an important step towards enhancing the efficiency and effectiveness of the tourism sector. As part of smart tourism, digital tools and platforms are used to enhance the tourist experience, including activities such as booking, navigation, and personalized recommendations (Xiang et al., 2017). In addition, digital tools could have been utilized in various locations for the preservation and protection of different tourism products, including intangible heritage. By integrating smart tourism into rural areas, there is potential to revolutionize the tourism industry and stimulate economic growth in these regions. In the last few years, there has been a growing body of research that emphasizes the importance of digitalization in rural

tourism, exploring different factors that influence its implementation, such as infrastructure availability, stakeholder collaboration, and tourist needs (Rosalina et al., 2021).

In developing countries, the rural tourism industry typically follows a traditional path, with smart tourism remaining relatively unpopular (Zhu and Shang, 2021). In fact, limited access to ICT infrastructure in rural areas has made smart technologies unavailable for tourism businesses, which resultantly suffer from lack of enough knowledge and skills in using such technologies (Roberts et al., 2017; Shafiee et al., 2022). Indeed, the absence of sufficient attention to the distribution of infrastructure and facilities has widened the digital gap between urban and rural tourism activities in most countries including Iran (Nchake and Shuaibu, 2022). In general, rural areas and the rural tourism industry are suffering at three levels of digital gaps: degree of access and use of digital technologies, stakeholders' skills and digital literacy, and use of such technologies to obtain and capitalize on competitive advantage (Salemink et al., 2017). The presence of these three digital gaps further exposes vulnerabilities in rural areas (compared to urban regions) in the face of crises (Davies, 2021). For example, numerous studies have indicated that accommodation centers in rural tourist attractions that offered limited smart technologies could not compete with rivals which have free access to such technologies (Bagheri and Abdi, 2021; Ghaderi et al., 2022a).

In developing countries, the promotion of STT in rural area heavily relies on government involvement (Galloway and Mochrie, 2005; Roberts et al., 2017; Salemink et al., 2017). In fact, the available market in rural areas is not attractive to the private sector, which prefers to focus on cities because of the lower risk and cost and the higher benefit from this form of investment (Galloway and Mochrie, 2005; Li et al., 2022; Pade et al., 2011). Moreover, in certain countries such as Iran, the public sector possesses and manages approximately 70 % of the entire economy, resulting in a significant amount of influence over the private sector (Ghomi, 2021). As a result, governments of such countries can contribute to the promotion of digital literacy and fairness through investing in developing rural ICT infrastructure (Galloway and Mochrie, 2005). Therefore, it is highly unlikely to witness the implementation of national plans to eradicate digital gaps unless hard political decisions are made and governments actively participate in the process (Bagheri and Abdi, 2021; Shafiee et al., 2022). Thus, in the current study, we focused on the role of government in helping in the deployment smart technologies in general and STT in rural area in particular during the COVID-19 pandemic.

In the past two years, the response to COVID-19 has disrupted almost all aspects of people's daily lives, regardless of their socioeconomic status in both urban and rural areas (Davies, 2021; Gössling et al., 2020; Kock et al., 2020). In order to minimize access issues and offer proper services to their citizens, governments had to develop ICT infrastructure in both urban and rural areas (Morris et al., 2022). Nevertheless, there is a huge digital divide between urban and rural areas in developing countries (Velaga et al., 2012). Citizens in urban areas enjoy a higher degree of access, knowledge, and skills in using smart technologies (Torabi et al., 2022). This was especially evident in the coronavirus outbreak; urban citizens could almost immediately adapt themselves to the new situation using smart technologies, hence minimizing the impact of challenges and problems caused by the restrictions and social distancing (Sharifi and Khavarian-Garmsir, 2020).

People in rural areas were not able to fully benefit from smart technologies during the pandemic (Morris et al., 2022; Velaga et al., 2012). In general, governments augmented their investment in various economic sectors, particularly in ICT infrastructure, during the COVID-19 pandemic. However, only a comparatively small proportion of these investments were allocated to rural areas (Palmer-Abbs et al., 2021). Given that villages are scattered and there are not a lot of ICT users in rural areas, it is not economical for the private sector to spend money on digitalizing these regions (McMahon and Akçayır, 2022). Therefore, it was the responsibility of governments to provide the necessary infrastructure by either directly investing in the development of ICT infrastructure or providing appealing incentives to the private sector, thereby encouraging them to consider investing in rural areas (Salemink et al., 2017). Moreover, since in most of the centralized political systems, such as Iran, governments are directly responsible for developing infrastructure, promoting skills, and deciding on the type of provided digital services, and their policies and decisions are decisive in developing smart technologies (Barrutia and Echebarria, 2021). In such countries it is virtually impossible to develop ICT infrastructure in rural areas without the government taking a major role (Palmer-Abbs et al., 2021; Roberts et al., 2017).

The impact of crises on changing policies and attitudes in digital development is significant as such crises may adjust hard positions of governments resistant to new global changes (Nchake and Shuaibu, 2022; Okafor et al., 2022). The development of smart technologies in Iran has been a contentious topic among political parties since the Internet was introduced in the country (Seyfi et al., 2019; Seyfi and Hall, 2018; Torabi et al., 2021). Many domestic political parties are reluctant to embrace people's wide scale access to smart technologies (Torabi et al., 2019, 2021) and try to ensure that citizens will use such technologies in a controlled and supervised way (Ghaderi et al., 2022b; Rezvani et al., 2019). The condition is more complicated in rural areas of developing countries, whereby some cultural beliefs also hinder the development of smart technologies (Cowie et al., 2020). Under normal conditions, therefore, governments within such social structures are not in favor of fast and free development of smart technologies, a situation that is more complicated by the presence of specific cultural values (Komasi et al., 2022; Sharifi et al., 2021). Experiencing crisis and the ensuing conditions, however, force governments and cultural groups to adjust their attitudes (Li et al., 2022). With regard to the tourism industry, crises can create historic opportunities for tourists and tourism-related businesses, so that they can easily utilize smart technologies to meet their needs (Bulchand-Gidumal, 2022). Government investment in ICT and smart technologies during the pandemic has partially contributed to the digitalization of tourism industry in rural areas in developed countries (Maquera et al., 2022). As a result, upon travel restart, a measurable improvement was observed in some rural tourism areas in terms of travel planning, content creation in social networks, advertisement, accommodation booking, and communication with tourists (Gössling and Schweiggart, 2022; Kim et al., 2022; Vaishar and Šťastná, 2022). Although a large bulk of studies have focused on behavioral and expectation-based change in the tourism industry after the pandemic outbreak, there is little research on stakeholders' lived experience to demonstrate how the process has been undertaken in developing countries.

2.1. Capacity building

Capacity building (CB) has a wide range of meanings (Craig, 2007). Ghaderi et al. (2018) believe that the definition of CB largely depends on the context it is used. From a general standpoint, however, CB may be defined as the collection of activities, resources, and supports aimed to promote individual, institutional, and social skills and abilities. To gain a better understanding of the concept, CB may be looked upon from nine dimensions: (1) learning opportunities and skill development; (2) resource mobilization; (3) partnership/linkages/networking; (4) leadership; (5) participatory decision making; (6) assets-based approach; (7) sense of community; (8) communication; and (9) digital competencies (Liberato et al., 2011; Slocum and Backman, 2011).

To eradicate digital gaps, it is suggested that long-term and short-term CB plans be implemented. CB programs provide the opportunity for users to improve their digital competencies (Creese et al., 2020), which refers to individual and institutional skills and abilities. CB may occur at individual, organizational, and institutional-social levels (Craig, 2007; Liberato et al., 2011), with the first level often seen as the most important type of capacity building (Doshmangir et al., 2022; Flores and

da Costa, 2018). This level covers individuals' ability to develop a set of goals and make attempts to achieve them by using their knowledge and skill. In the present research, CB at the individual level refers to individuals' knowledge, attitude, and skills to use STT in rural area. The individual capacity of stakeholders who use STT in rural area can improve in various ways such as offering formal and informal education, providing opportunities for pre-service and in-service training, and encouraging independent study (Gaved et al., 2015). One of the biggest problems in rural areas in developing countries is stakeholders' insufficient skills in using STT (Creese et al., 2020). Although in some cases the necessary ICT infrastructure is available, individual users may not be skillful enough to use it properly (Ghaderi et al., 2018; Slocum and Backman, 2011). Another important problem in developing countries is people's negative attitudes towards smart technologies, which are sometimes believed to be in conflict with social values (Maquera et al., 2022). Therefore, CB programs may improve individuals' knowledge, attitudes, skills, will, and ability to use STT (Esteban et al., 2020).

At the institutional level, CB is associated with formal institutions (e.g., laws, policies, rules and regulations), informal institutions (e.g., traditions, culture, and norms), social capital, social infrastructure, and the capacity of individuals and organizations in a particular setting (Aref and Redzuan, 2009; Doshmangir et al., 2022). Developing plans and rule to support digitalization in rural areas can accelerate investment in these regions (Esteban et al., 2020). The presence of social capital and social infrastructure can also boost stakeholders' motivation to actively participate in improving their knowledge and skills in using smart technologies (Flores and da Costa, 2018). It is highly critical to improve institutional capacity in countries whose institutional structure is historically not conducive to developing new technologies, including STT (Okafor et al., 2022). One of the factors contributing to digital divides at both international and local level is the presence of inflexible institutional structures (Maquera et al., 2022). In such contexts, most of the ruling institutions try to constrain and/or control people's access to communication tools with the aim of retaining their power (Aref and Redzuan, 2009). The process of accepting and using new technologies can be precipitated and digital injustice can be partially eradicated through improving institutional capacity (Ghaderi et al., 2018). This can be achieved by offering new incentives, improving social capital, developing efficient policies and regulations on using digital technologies, and making attempts to change the dominant culture (Liberato et al., 2011).

CB programs implemented in many developing countries to improve the tourism industry either have failed or have not been able to achieve their goals (Esteban et al., 2020). One of the underlying reasons for the failure of many CB programs is lack of motivation and necessary overlap in stakeholders' objectives (Craig, 2007; Eade, 2007; Sharma et al., 2017). Nonetheless, it seems that crises have the ability to increase the likelihood of successful implementation of CB programs through the urgency that arises in consensus building among stakeholders (Bricout et al., 2021; García-Milon et al., 2021; Yan and Saguin, 2021). There appears however to be no published study that examines the impact of crises like the COVID-19 pandemic on improving individual and institutional capacities of tourism stakeholders in using smart technologies. As a result, the current study explores the effect of CB programs during the pandemic on developing STT in rural area in both individual and institutional dimensions.

3. Methodology

Thematic analysis, which is a qualitative method of data analysis, was used to examine the influence of COVID-19 responses on implementing CB programs to improve the use of STT after the travel restart. The study was conducted in five villages including Abyaneh, Mesr, Abr, Rezaabad, and Qalebālā. The reason for selecting these villages for the study was two-fold. Firstly, they are popular tourist destinations in Iran and attract a substantial number of visitors every year. Secondly, during the pandemic, various CB programs were implemented in these villages to enhance the utilization of smart technologies (Fig. 1).

3.1. Participants and sampling

In this study, we selected five villages in Iran based on official data and consultation with governmental and non-governmental organizations, focusing on those that had experienced changes in the use of smart tourism technologies after COVID-19. After initial discussions with village managers, we employed snowball sampling to identify knowledgeable respondents, approaching 91 potential participants, of whom 79 consented to participate in the study. To avoid bias, we collected data from respondents representing various stakeholder groups affected by smart rural and tourism technologies. Table 1 illustrates the wide range of stakeholders who participated in the study. Given the sensitivity of the topic, we anticipated that traditional families and conservative managers in the public sector might be hesitant to share their views unless they had trust in the researchers. Although the adoption of smart technologies is a straightforward issue in many countries, we encountered difficulties in obtaining information, especially from government organizations and certain groups in the villages, leading to prolonged interview periods in the field. Nonetheless, in the spring of 2022, two independent research groups traveled to the villages and spent considerable time with stakeholders, establishing trust and encouraging them to share their experiences and challenges with adopting smart technologies. Respondents were then formally invited to participate in the study.

3.2. Data collection

The study employed pre-arranged appointments for interviews, conducted either over the phone or in person, as preferred by the participants. Potential respondents were contacted by telephone and invited to participate. The semi-structured interview guide consisted of four questions We selected our interview questions based on a thorough review of the literature and consultation with experts in the field. We focused on questions that would elicit in-depth and detailed responses from our participants, and that would allow us to explore a range of relevant themes and issues:

- What were the challenges faced by you and your business during the mandatory use of smart tourism technologies when COVID-19 pandemic-related restrictions were in place?
- How did government and non-governmental organizations assist the tourism industry in developing information and communication technologies and smart tourism technologies to mitigate these challenges?
- Did the measures taken during the pandemic enhance the knowledge and skills of you and other organizations in using smart tourism technologies?
- Have the actions taken during the pandemic changed the attitudes of beneficiaries, such as the government and religious groups, towards using smart tourism technologies?

The questions are aimed to reveal the processes and impacts of the COVID-19 pandemic on the use of smart tourism technologies in rural areas. Additional questions were asked when necessary. The research team examined the processes that affected the development and use of smart tourism technologies in rural areas by exploring general topics of behavior change and smart technology development. Given that political, cultural, social, and economic factors influence smart tourism technology development in developing countries, a broad perspective was necessary. For example, in a country where the government impedes the development of smart tourism technologies, political attitudes cannot be overlooked.

All interviews were recorded, except for 15 participants who

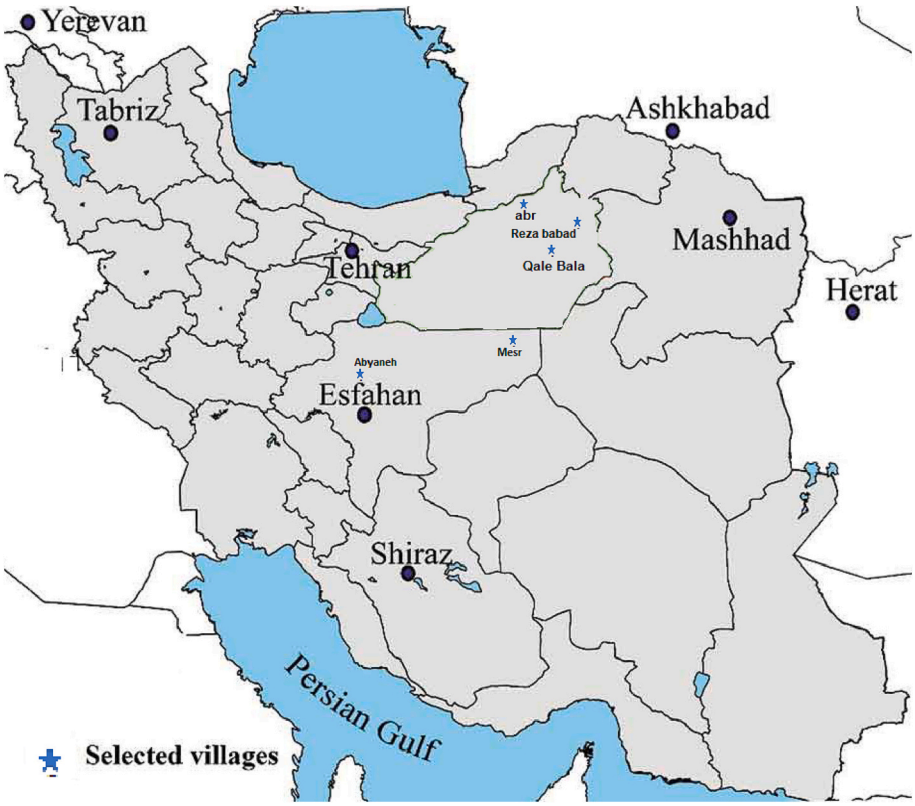

Fig. 1. The location of the selected villages in Iran.

Table 1
Respondents' profile.

Village	Ahar		Rezaabad		Mesr		Abyaneh		Qalebālā	
Sector	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Local households	2	1	3	2	3	3	2	2	2	1
Village authorities	2	1	2	2	2	3	2	1	3	1
Tourists	2	2	2	1	3	1	2	1	2	0
Tourism managers	2	3	3	3	2	3	2	2	1	2
Total	8	7	10	8	10	10	8	6	8	4

$N = 79$

declined to have their voices recorded. For unrecorded interviews, the interviewer took field notes. The interviews were translated from Farsi and then to English. Before the interviews, the research purpose was clearly explained to participants, and they were assured that their data would remain confidential. The data collection process continued until theoretical saturation was reached, and after conducting 79 interviews, the research team concluded that additional interviews would not provide new insights. The length and number of interview questions varied depending on the topic and the participant's response. However, on average, each interview lasted approximately 45–60 min, and we asked between 10 and 15 questions per interview.

3.3. Data analysis

In this study, we utilized thematic analysis to analyze interview data, ensuring transcription reliability and familiarity by reviewing verbatim transcriptions and notes multiple times. The immersion technique was employed to uncover underlying meanings, constructs, themes, and patterns in the data, supplemented by the MAXQDA textual analysis program. To fully address our research questions, we employed both logical and intuitive thinking, used open coding and charting to visualize data, and grouped codes based on semantic and conceptual relationships. We selected main themes for each code network, linked to sub-codes/sub-themes to better understand the relationships between concepts. To ensure research validity, we sent transcribed interviews back to respondents for review, though only one-third provided additional feedback. Nonetheless, our emergent thematic structure and codes captured the social distribution of issues raised and reflected the subjectivities of the respondents' experiences. Our analysis was based on keywords and categories developed from the research question and emerged themes. To present findings in a clear and organized manner, we structured interview texts according to themes and categories and used quotes and examples to illustrate our results.

4. Results and discussion

4.1. COVID-19 and efforts to access and increase skills in using STTs

The analysis of interview data revealed that, at the beginning of the pandemic outbreak, most of the residents in the selected villages had little access and skills to use smart technologies during the restrictions (Fig. 2). Two groups in these villages dealt with notable challenges; those people who could not have access to smart technologies because of their poor socioeconomic status; and villagers who had some access to

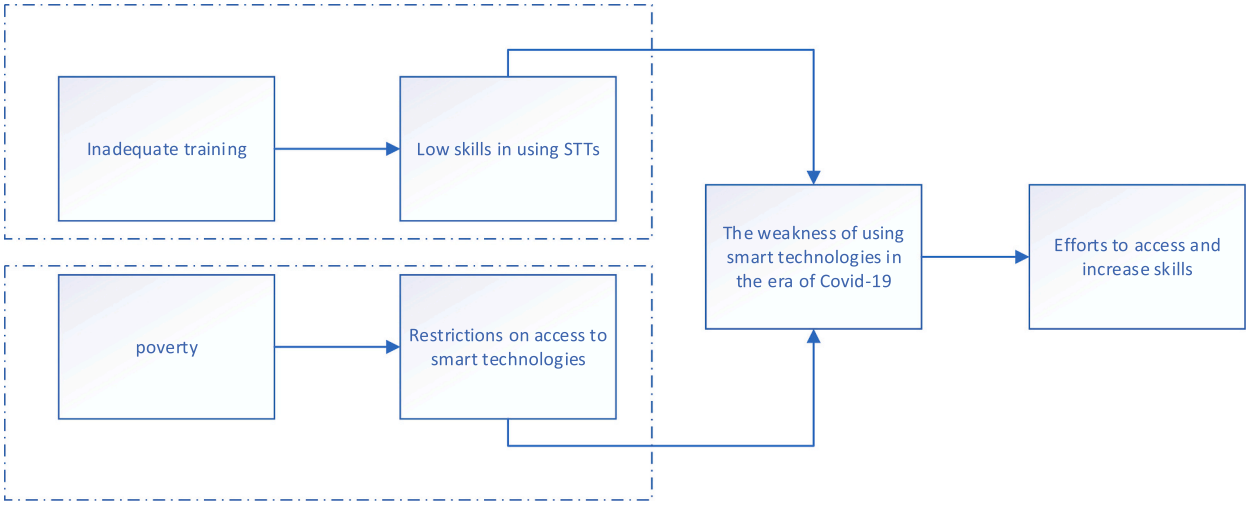

Fig. 2. COVID-19 and Efforts to access and increase skills in using STTs.

smart technologies but did not possess enough skills to use them. In this regard, many respondents contended that they had not received enough training to use such technologies. Therefore, they were anxious and confused with respect to how they were supposed to use smart technologies to fulfill their needs. To adjust themselves to new conditions, they were forced to immediately learn how to use such technologies, which was a path full of challenges.

The findings of this study align with previous research that highlighted the challenges of limited access and skills in using smart technologies, particularly among marginalized populations. For example, Van Dijk (2012) found that people with lower levels of education, income, and digital skills were less likely to have access to and use the Internet. Similarly, Warschauer and Matuchniak (2010) showed that people from disadvantaged backgrounds were less likely to use technology for educational purposes, which could be a hindrance during the pandemic when education moved online. Moreover, the study's findings are consistent with the literature on the impact of COVID-19 on digital inequalities, with the pandemic often exacerbating existing disparities in access to and use of smart technologies, particularly among marginalized populations (Blank and Reisdorf, 2023; Sigala, 2020). The study also highlights the importance of investing in infrastructure development and training programs to ensure that everyone can access and use smart technologies fully (Aziz et al., 2020).

4.2. Change in the socioeconomic status and tourists' expectations

The findings of this study shed light on the changing dynamics of tourism in rural areas during the COVID-19 pandemic. The shift in the socioeconomic status of tourists and their preferences for travel led to an increased demand for digital services in tourist destinations (Fig. 3). Prior to the pandemic, the majority of tourists visiting the selected villages came from middle- or low-class families and used to travel in groups as part of a tour. However, during the pandemic, there was a significant increase in the number of tourists from higher income families who preferred to travel individually or with their family members to rural areas. In this regard, a manager of a rural accommodation said, *"At the beginning of the pandemic outbreak, the number of tourists dwindled. But, after a short while, tourists began to visit the village again. The difference was that they did not come in as tours; they travelled individually or with their families. Thus, accommodation centers which offered internet marketing and online services could attract a larger number of tourists."*

We found that tourists who visited the rural accommodations during the pandemic demanded Wi-Fi, online booking, and other digital facilities. As another rural accommodation manager argued, *"Some months into the pandemic, tourists who visited our lodge demanded Wi-Fi and stuff …. They urged us to provide [digital] facilities they required. They also asked us to offer online booking …. In fact, we faced a situation that we had not*

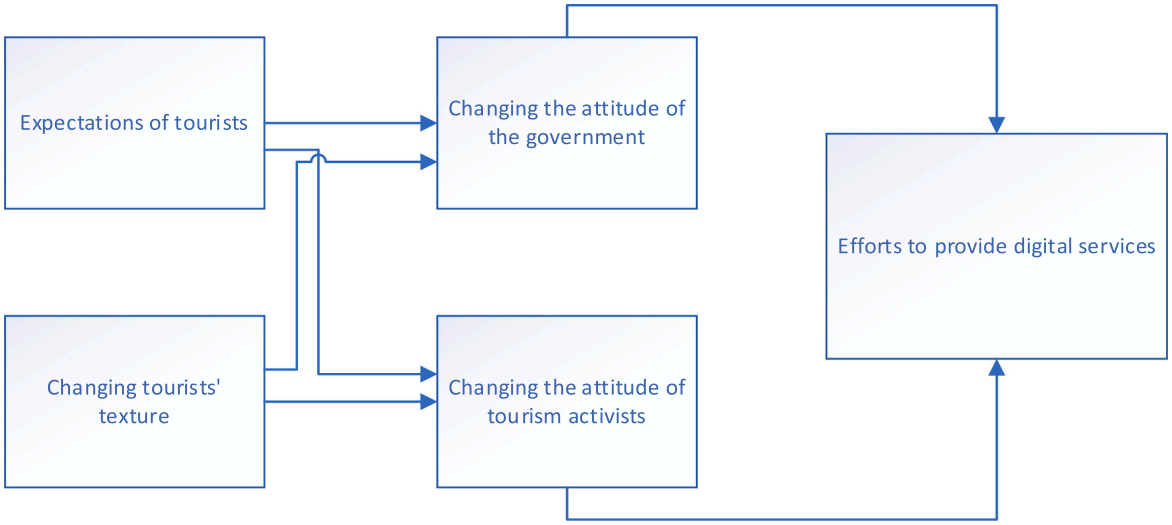

Fig. 3. Change in the socioeconomic status and tourists' expectations.

experienced before." The increased use of digital technologies in tourism has become a vital factor in the competitiveness of destinations (Chan et al., 2022; Tang, 2023). The study also found that prior to the pandemic, stakeholders in the selected villages had limited capabilities in using smart technologies. This finding is consistent with previous research that highlights the need for CB to enhance the knowledge and skills of stakeholders in rural areas to use digital technologies (Goh and Sigala, 2020). The COVID-19 pandemic has acted as a catalyst for the adoption of digital technologies in rural areas, as stakeholders have recognized the importance of digital services in attracting tourists and meeting their needs. The study also found that the government's attitude towards CB programs to enhance individuals' knowledge and skills in using smart technologies has changed. This finding highlights the importance of government support for CB programs in rural areas. Previous studies have emphasized the need for government support for digital transformation in rural areas (Yigitcanlar et al., 2020).

4.3. Adjusting attitudes and flexibility

The results of interview analysis demonstrate that the pandemic changed the government''s attitude, encouraging it to invest in ICT infrastructure and design short- and long-term programs to improve digital literacy in underdeveloped and rural areas (Fig. 4). The government's decision to initiate significant digital development in rural areas is groundbreaking since, in recent years, the development of ICT infrastructure has not been a priority for policy makers due to the unilateral economic sanctions imposed by the United States. There are also some influential conservative political and social groups when it comes to developing bandwidth and digital literacy. They are sometimes opposed to developing these technologies on a wide and uncontrolled scale. As the government adjusted its attitude, public institutions related to rural tourism in local settings made attempts to grab the opportunity to improve the extensive use of STT in the studied villages. The pandemic has spurred governments to reevaluate their policies regarding digital infrastructure and invest in initiatives aimed at improving digital literacy and access to technology, particularly in rural areas. Regarding the shift in the government's attitude towards digital development in rural areas after the pandemic outrage, one of the respondents said, *"In countries with a centralized government that controls most of the affairs, political changes are immediately implemented by middle range and local executive managers. The pandemic is a good example in which political changes led to digitalization of rural areas and tourist attractions in a short time."* A local manager also claimed, *"When the government's policies changed with regard to digitalizing businesses and designed some plans and incentives for smart technology development, many people in rural areas who were already engaged in tourism business were encouraged to include using smart technologies at the top of their agenda …. They not only take advantage of the incentives, but also feel more secure and freer to act."*

However, the study's findings suggest that government policies alone may not be sufficient to bring about a complete shift in attitudes towards technology. Conservative political and social groups may oppose such initiatives, and there may also be cultural barriers that

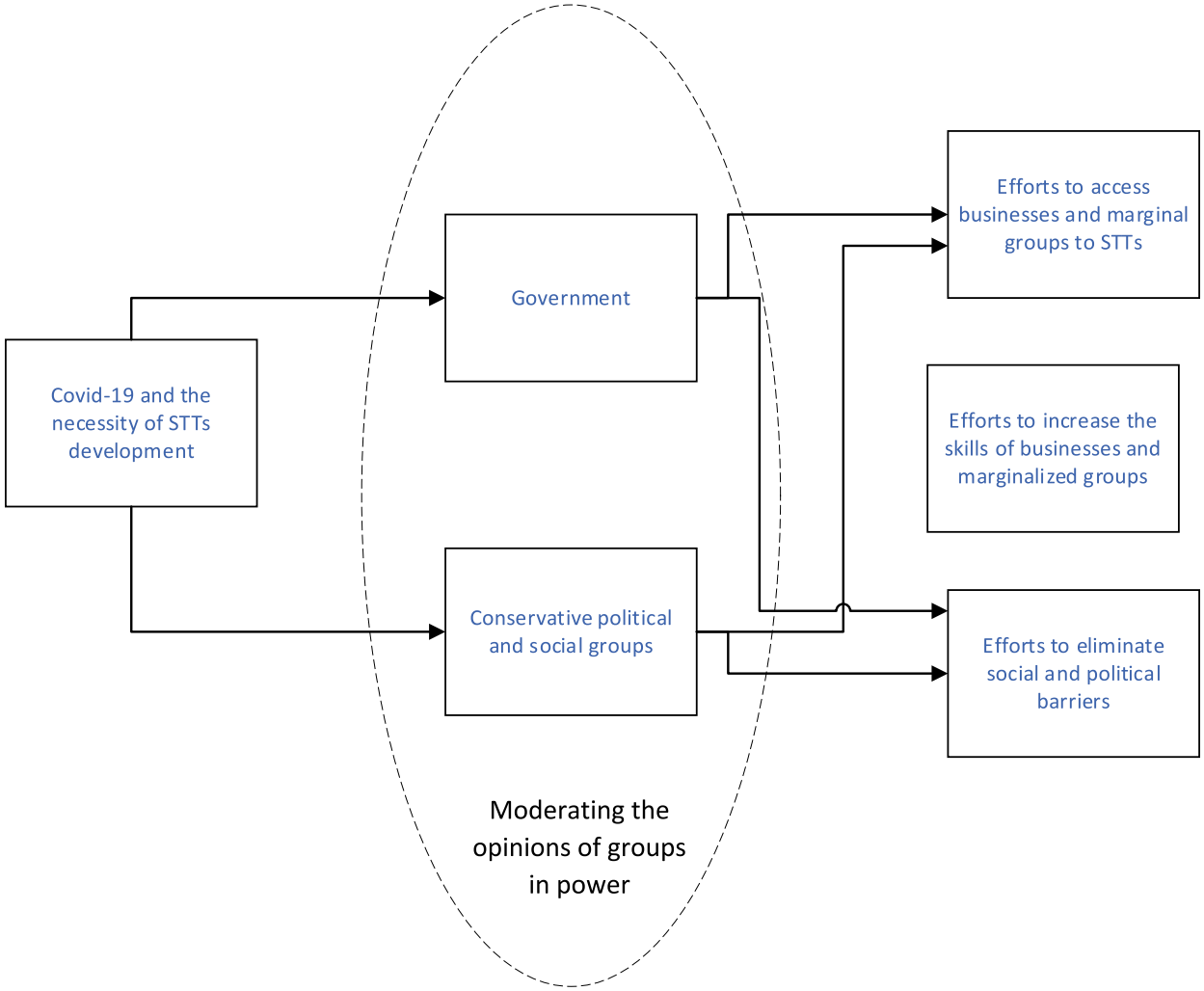

Fig. 4. Changing the attitude of the stakeholders in the use of STTs.

prevent some individuals from embracing technology. Nevertheless, the pandemic seems to have played a critical role in changing rural stakeholders' attitudes towards technology, as it forced them to adapt to new realities and recognize the potential benefits of technology.

These findings are consistent with previous literature that highlights the importance of digital technology in rural development. According to the International Telecommunication Union (ITU), access to digital infrastructure and services is crucial for achieving sustainable development in rural areas (Clark et al., 2022). Furthermore, the results are in line with recent research that has focused on the role of digital technology in tourism development. For example, a study by Buhalis and Amaranggana (2015) highlights the potential of digital technology to enhance the tourism experience for visitors and create new opportunities for local businesses in rural areas. Similarly, a study by Xiang et al. (2017) argues that digital technology can help to address the challenges faced by rural tourism destinations, such as limited resources and access to markets. The findings also shed light on the impact of the COVID-19 pandemic on digital technology adoption in rural areas. This is consistent with recent literature that has explored the pandemic's impact on digital transformation and e-commerce (e.g., Alalwan, 2020; Aissaoui, 2022).

4.4. Improved access and implementation of CB programs

The COVID-19 pandemic highlighted the necessity of using smart technologies, prompting policymakers to improve information and communication technology (ICT) and smart technology infrastructure in rural areas to facilitate citizens' access to these technologies. The results of this study reveal that despite initially restricted access to smart technologies in the selected villages, governmental support, charity organizations, and non-governmental organizations (NGOs) have facilitated access to these technologies for many villagers, particularly those living in poverty-stricken regions. The government's efforts to increase bandwidth and provide wireless internet in rural areas that were not covered by the national Internet system, along with their provision of smart technologies to school and university students, have helped bridge the digital divide.

One of the significant challenges in rural areas was the lack of sufficient skills among local organizations, citizens, and people engaged in the tourism business in using smart technologies. CB programs were implemented at different levels to help stakeholders utilize ICT technologies more efficiently. The village managers recognized the importance of providing necessary training for families and school/university students, which they mobilized all their forces to accomplish. National and private media also played a vital role in implementing CB programs to enhance citizens' digital literacy. The study found that people who were engaged in businesses that required a more professional understanding of smart technologies embarked upon a self-learning process as they became familiar with the introductory steps through CB programs.

Furthermore, the study found that a consensus was established among all stakeholders, facilitating the implementation of CB programs. As one of the villagers stated, TV advertisements could change the attitude of many villagers towards the Internet, and in the past, TV authorities did not provide such advertisements. These findings suggest that CB programs can be an effective approach to improve the skills of stakeholders in using smart technologies, particularly in rural areas. Therefore, policymakers should focus on not only improving the ICT infrastructure but also providing the necessary training and support for stakeholders to use these technologies effectively.

4.5. Stakeholders' individual and institutional capacity after the travel restart

4.5.1. Individual capacity

The current study's findings indicate that prior to the pandemic outbreak, most of the respondents had little to no knowledge of smart technologies, which limited their use in tourism-related businesses. Some stakeholders had access to such technologies but lacked the necessary skills to utilize them effectively. However, the implementation of CB programs provided an opportunity for tourism activists in selected villages to improve their digital capacities and develop their businesses using smart technologies. Individual CB programs were particularly effective in improving stakeholders' knowledge of smart technologies. Respondents noted that prior to the pandemic, they were unaware of how to use online stores or plan trips using mobile applications. However, after participating in training programs, stakeholders gained confidence and motivation to use smart technologies to their advantage. This was evidenced by the increase in online bookings and the adoption of social networks as a means of attracting tourists.

The study also revealed that content creation and participation in social networks were two critical skills that respondents acquired to attract tourists and promote their villages. Social networks were found to be an essential tool for attracting customers, especially as most people now own a smartphone and are members of social networks. As a result, many stakeholders turned to social networks to promote their businesses and were relatively successful in doing so.

Moreover, the study found that villagers played an essential role in attracting tourists through social networks, with a considerable proportion of tourists visiting the village because of their exposure to content produced by villagers on social networks. This highlights the importance of community involvement in promoting tourism and using smart technologies to their advantage. With respect to the role of villagers in attracting tourists through social networks, local manager said, *"Many villagers were not previously active in social networks. But nowadays there are only few people with no presence in Instagram and Telegram. The villagers are keen on advertising the attractions of their village. In fact, a considerable portion of tourists visit the village as a result of their exposure to the content produced in social networks and the villagers' activities in these networks."*

These findings are in line with the existing literature on the role of smart technologies and social media in tourism. Many studies have highlighted the importance of smart technologies in enhancing tourism experiences and improving business efficiency (Buhalis and Amaranggana, 2015; Chandra et al., 2022). However, there is also evidence suggesting that many small tourism businesses and stakeholders lack the necessary knowledge and skills to effectively use these technologies (Sigala, 2020). This study's findings support this notion, as many of the respondents reported had little to no prior experience with smart technologies before the pandemic. The results suggest that CB programs can be successful in empowering stakeholders to use smart technologies to enhance their businesses. The participants in this study reported increased efficiency, lower costs, and higher customer satisfaction as a result of their improved digital literacy. The importance of social media in tourism marketing and promotion is widely recognized (Gretzel et al., 2015) and he findings of this study support this notion, as many of the respondents used social media to attract customers and promote their businesses.

4.5.2. Institutional capacity

The findings indicate that Iran's government traditionally showed a conservative attitude towards the development of ICT technologies and social networks. This led to limited capacity and slow progress in the adoption of smart tourism technologies (STT) in the country. However, the COVID-19 pandemic had a significant impact on the popularity and need for smart technologies, resulting in a change in the government's attitude towards their development. The government-initiated CB programs at micro and macro levels to promote the adoption of smart technologies, resulting in remarkable improvements in various institutions' capacity, including tourism-related activists, social groups, associations, trade unions, business institutions, formal and informal socioeconomic networks, state organizations, public sector institutions, and legal and regulatory frameworks (Fig. 5).

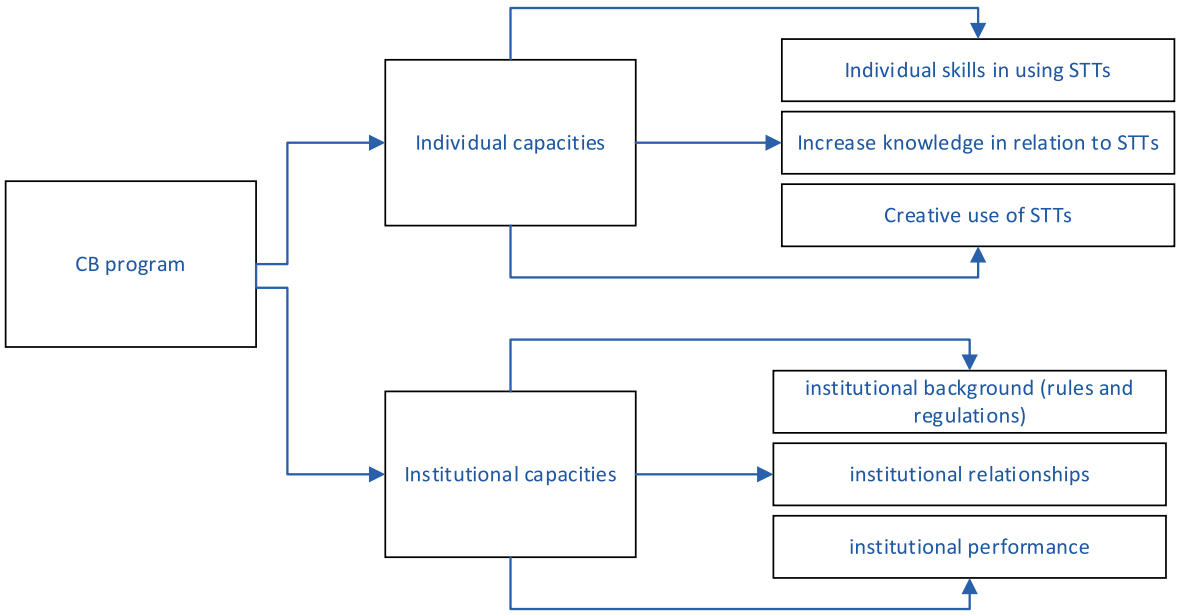

Fig. 5. Increasing the individual and institutional capacities of tourism stakeholders.

The development of institutions in rural areas was another significant outcome of the CB programs, aimed at ensuring the sustainable development of smart tourism technologies in the future. As a result, private institutions emerged to support the development of smart tourism in rural areas, removing obstacles that hindered the digitalization of these regions. While powerful state organizations initially opposed uncontrolled development of smart technologies, CB programs aimed to enhance their flexibility and the bargaining power of NGOs. As a result, nongovernmental organizations and associations that had little power before the pandemic gained bargaining power in local settings, leading to improved interaction with people and state organizations.

The pandemic also had a positive impact on the setting of clearer goals related to digitalizing tourism, which was nonexistent before. As a result, institutional capacity and support increased, motivating the private sector to offer services to rural areas, further boosting institutional capacity in these regions. Overall, the CB programs successfully empowered the available institutions in developing smart technologies in three dimensions, including institutional background (rules and regulations), institutional relationships (inter-organizational relationships, as well as the interaction between state/private organizations and people), and institutional performance (satisfaction, accountability, and transparency).

Several studies have highlighted the previous lack of government support for ICT and social media development in Iran (Khalil Moghaddam and Khatoon-Abadi, 2013). These studies suggest that the Iranian government has been cautious about the potential social and political consequences of ICTs and social media, which has limited their development in the country. However, the COVID-19 pandemic brought about a change in the government's attitude towards the use of smart technologies, as observed in this study. The implementation of capacity-building programs at micro and macro levels led to significant improvements in the capacity of tourism-related institutions and other socio-economic networks This suggests t that CB is essential for enhancing the quality of digital content and services, improving digital literacy, and fostering collaboration between different stakeholders in the tourism industry in developing countries such as Iran. The study's findings suggest that the capacity-building programs implemented in Iran were successful in achieving these goals, leading to significant improvements in the capacity of tourism-related institutions and other socio-economic networks.

The study also highlights the role of nongovernmental organizations (NGOs) and associations in promoting the development of smart tourism in rural areas. This finding is consistent with the literature that emphasizes the importance of stakeholder engagement and collaboration for the successful implementation of smart tourism initiatives (Ballina, 2022; Zhu and Shang, 2021). The study's finding that NGOs and associations gained notable bargaining power in local settings is particularly noteworthy, as it suggests that these organizations can play a critical role in promoting the development of smart tourism and influencing policy decisions.

5. Conclusion

This research examines the effect of the COVID-19 pandemic on the government's attitude towards and implementation of capacity building programs to develop and use smart technologies in rural areas. It also investigates how such changes will affect the use of rural smart tourism technologies after the travel restart. To gain a better understanding of the developmental process in these areas, the study examines participants' experiences in the three domains of ICT technologies, smart technologies, and smart tourism technologies. The study contributes to the literature by focusing on rural areas in a developing country affected by sanctions, the influence of capacity building programs on access to smart technologies, and the change in attitudes towards smart technologies due to the CPVID-19 pandemic.

Before the pandemic, smart technologies played a limited role in tourism in the studied villages due to private sector disinterest and traditional lifestyles, among other factors. However, the government's extensive intervention during the pandemic measurably increased access to smart technologies and reduced the digital chasm. Capacity building programs also minimized the digital chasm and improved stakeholders' individual capacity to creatively use smart tourism technologies to meet their business needs. The study concludes that government plays a critical role in the development of smart tourism technologies in developing countries, and crises may cause adjustments to the opposition to smart technologies by political parties and governments (Fig. 6).

5.1. Theoretical implications

The theoretical implications of this study align with prior literature, which has primarily focused on the impact of the pandemic on smart

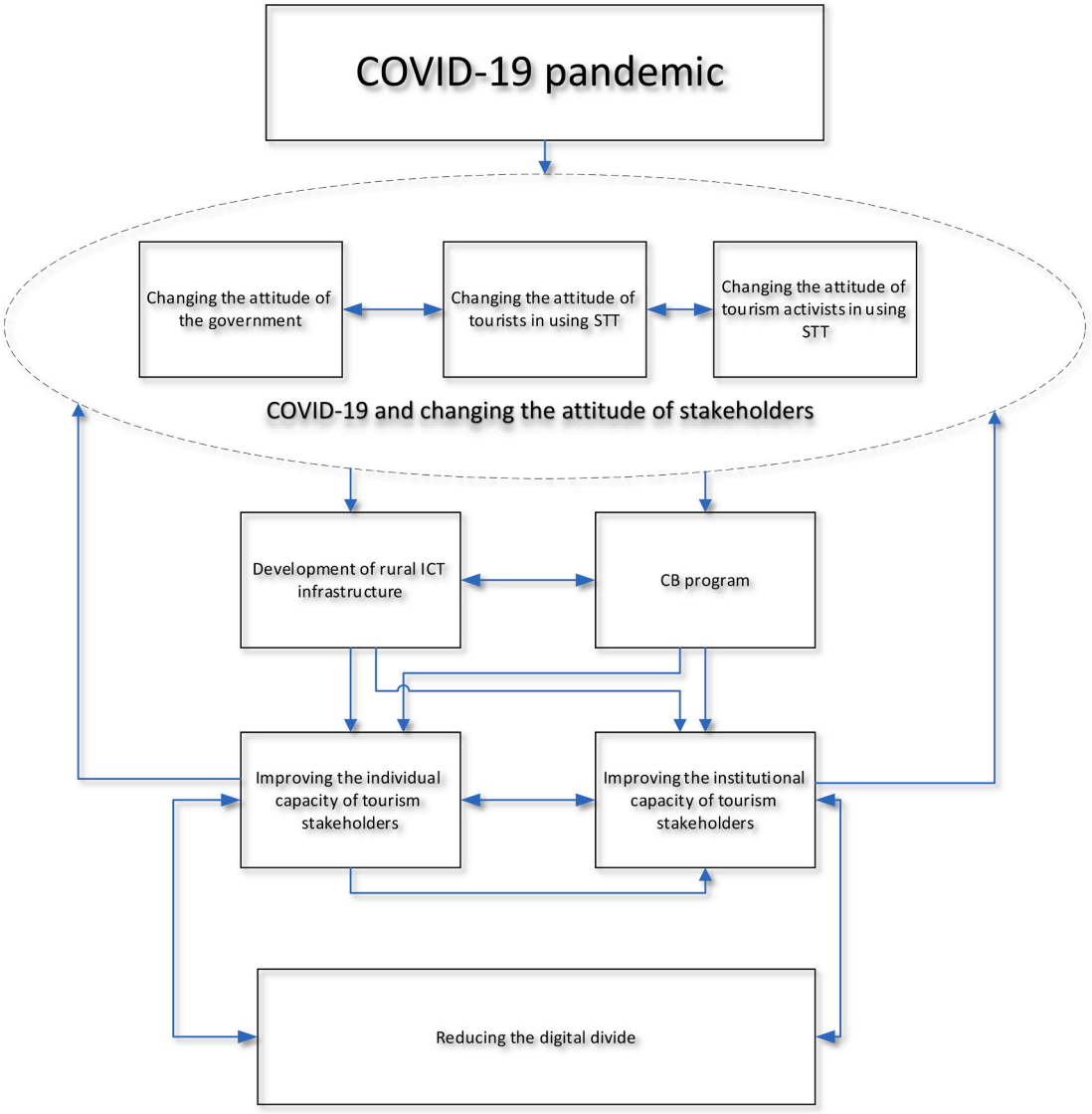

Fig. 6. COVID-19 and increasing individual and institutional capacities and reducing the digital divide.

tourism technology development in urban areas. However, this study offers novel insights into the impact of the pandemic on smart tourism development in rural regions. For instance, the study highlights the importance of capacity-building programs in promoting the adoption of smart tourism technologies in rural regions (Aref and Redzuan, 2009).

Additionally, this study offers insights into the digitalization experience in rural areas during the pandemic, which is a relatively under-researched area. The study highlights the role of digital technologies in promoting rural development during the pandemic, which is consistent with prior research that has emphasized the potential of digital technologies in promoting rural development (Aruleba and Jere, 2022; Rudwiarti et al., 2021). Furthermore, the study's findings on stakeholder attitudes and behaviors towards smart tourism technologies are consistent with prior research that has emphasized the importance of stakeholder buy-in in promoting the adoption of new technologies (Lu et al., 2021). The study's emphasis on developing effective and sustainable smart tourism strategies also reinforces the need for sustainable tourism development (Shafiee et al., 2022; Rodrigues et al., 2022). Overall, this study contributes to the existing literature on smart tourism technology development by providing novel insights into the impact of the pandemic on rural regions. The study's findings on CB, digitalization, stakeholder attitudes, and sustainable tourism development have important implications for policymakers and tourism stakeholders interested in promoting the adoption of smart tourism technologies in rural areas.

5.2. *Practical and policy implications*

The findings of this research have significant practical and policy implications. Firstly, tourism policymakers and stakeholders can use the study's results to develop effective strategies for promoting the adoption of smart technologies in rural areas. Davies et al. (2020) emphasizes the potential of smart technologies in enhancing tourists' experiences and creating value for stakeholders in rural areas. Policymakers and stakeholders can leverage these insights to develop and implement smart tourism strategies that enhance visitors' experiences, improve destination management, and increase the competitiveness of rural tourism destinations. Secondly, investing in CB initiatives can help to equip rural communities with the necessary skills and knowledge to adopt and use smart technologies effectively. Zhu et al. (2022) highlight the importance of CB programs in promoting digital literacy and skills development among rural communities. Policymakers and stakeholders can use this research to develop CB initiatives that can help rural communities overcome barriers to the adoption of smart technologies, such as limited

access to technology and lack of awareness and knowledge. In summary, this research offers valuable insights into the role of smart tourism technology and CB in promoting sustainable tourism development in rural areas during the COVID-19 pandemic. The practical and policy implications of this research can guide policymakers, tourism stakeholders, and researchers in developing and implementing effective strategies for promoting the adoption of smart technologies in rural areas.

5.3. Limitations and suggestions for further research

In spite of the contribution of this research to the field, the current research suffers from some limitations. First, although we attempted to recruit heterogeneous respondents in the five selected villages, their viewpoints may not be representative of all rural tourist attractions, a limitation that should be addressed in future studies. Additionally, Iran is a multicultural country with a wide variety of ethnicities and cultures. Therefore, this study was focused solely on the religious-cultural context found in the central region of the country. In order to gain a more comprehensive understanding of people's attitudes towards STT, future studies need to expand their scope and look at other regions with diverse cultural backgrounds. To shed light on different aspects of the subject, deeper and widerscale research is required. For example, the impact of sanctions on accepting and using smart technologies in general and STT in particular after the pandemic outrage can be explored. From the social viewpoint, researchers may explore the influence of the large-scale use of STT after the pandemic outbreak on social conflicts and relations, social capital, cultural capital, and tourists' satisfaction and loyalty. Finally, from the environmental perspective, the effect of developing the use of STT during the pandemic on environmental sustainability is worth studying.

CRediT authorship contribution statement

Term	Zabih-Allah Torabi	Mohammad Reza Rezvani	C. Michael Hall	Zaheer Allam
Conceptualization	√		√	
Methodology/Study design	√	√	√	
Software	√			
Validation	√	√		√
Formal analysis	√	√	√	√
Investigation	√			
Resources	√	√		
Data curation	√			
Writing – original draft	√			
Writing – review and editing	√	√	√	√
Visualization	√			
Supervision	√	√	√	√
Project administration	√			
Funding acquisition	√			

Data availability

Data will be made available on request.

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