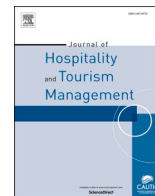


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Community eco-tourism in rural Peru: Resilience and adaptive capacities to the Covid-19 pandemic and climate change

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ABSTRACT

The recent outbreak of COVID-19 has been devastating for international tourism, adversely affecting destinations, organizations, and local communities. In particular, the crisis highlights the need for local communities reliant on rural tourism to enhance their resilience to the risks simultaneously generated by the pandemic and accelerating impacts of climate change. This is important as the effects of these hazards are intertwined and cannot be treated in isolation. We explore community responses and resilience through case study Quebrada Verde, Peru, a small rural community in the Andes Mountains. Specifically, we report on a qualitative examination involving in-depth semi-structured interviews and focus groups with key informants from the community, supplemented by relevant documentary analysis.

Drawing on community resilience and social networks perspectives, we find that the community's preparedness to both threats is unbalanced. On one hand, the community eco-tourism system has developed sufficient tools to adapt to the temporary effects of COVID-19 derived from the community's self-organization skills and topophilia. Specifically, the community possesses a cohesive social structure, it has a solid cultural identity rooted in its customs and traditions, and maintains a social humour that enables it to see the positive aspects of adversity. On the other hand, the analysis of the measures towards strengthening the resilience to climate change delivers mixed results. In particular, the relationship that the community has built with other local organizations to successfully prevent and react to climate change is weak. Therefore, stronger efforts towards bridging this gap must be implemented in order to sustain the wider social network of such organizations, of which the community is a part. This would enable further development and implementation of appropriate risk management strategies to counteract climate change, enhancing the community's resilience of its eco-tourism system to this emergent threat. Importantly, this finding might be relevant to other local communities seeking to improve their resilience to COVID-19 and climate change.

1. Introduction

The outbreak of the coronavirus disease in 2019 and the resulting COVID-19 crisis have forever changed the way individuals, communities, and organizations worldwide manage their plans and operations. This had a major impact on the global economic growth, to which, until recently, tourism has increasingly contributed. In fact, United Nations World Tourism Organization (UNWTO) reports that jointly with travel industry tourism has been the worst affected of all major economic sectors (UNWTO, 2020).

The reason for the high vulnerability of tourism lies in this sector's complex dynamics, which are characterized by a compounded non-linear network of relationships between societal and natural resources (Becken, 2013). In fact, a considerable volume of studies highlight the high susceptibility of tourism to risks and crises (e.g., Pappas & Papa-theodorou, 2017). The aforementioned complexity implies that an increased interdependence of the distinct resources augments the exposure of tourism to multiple threats. Consequently, the co-existence of multiple hazards generates a magnified impact on this sector and the dependent communities.

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Relevant resilience actions as part of broadly understood responsible tourism management (Stanford, 2000) are necessary not only in response to COVID-19, but most importantly due to the tourism's exposure to multiple societal and natural hazards. This is because isolated resilience measures targeted at individual threats will not eliminate the compound impact that these hazards jointly produce. Here, we examine the resilience strategies in the context of two hazards, COVID-19 and climate change.

The motivation behind the choice of these threats is twofold. First, both phenomena are intertwined through the spatial variability of ecosystems and the geographical distribution of some species that carry coronavirus (Beyer et al., 2021). Moreover, COVID-19 and climate change coincide in time provoking significant disruptions to global tourism activities, in particular the communities deriving their income from providing tourism offering. Second, despite some similarities, both events differ considerably with respect to the longevity and the type as well as the durability of impacts that they produce. Regarding the latter distinction, the impact of COVID-19 pandemic resonates more in the socio-economic context, whilst climate change brings more profound environmental implications. In terms of the longevity, the availability of vaccines and the general research progress concerning the coronavirus are expected to markedly reduce its spread and, in what follows, shorten the lifespan of the pandemic and its consequences. In contrast, climate change is characterized by constant permanence and different dynamics. Hence, examining the resilience in the context of a community exposed to these two related yet very different risks is the purpose of this article.

Specifically, we study the case of a rural community called *Quebrada Verde* (English: Green Ravine), which is the first to manage an important area of rural eco-tourism in Central Peru called the *Lomas de Lúcumo*. Our aim is to qualitatively analyse the community resilience to COVID-19 and climate change. To better understand the community's response to these distinctive threats and to embrace their compound effects, we adopt different theoretical approaches: community resilience and social network theory. While the concept of community resilience has been extensively explored in the literature (for the latest application of this theory see Zhang et al., 2020; Rendon et al., 2021; Musavengane & Kloppers, 2020; and Joseph et al., 2020), little or no attempt has been made to invoke the social network theory in a qualitative setting involving in-depth semi-structured interviews and focus groups with key informants (some relevant quantitative studies include Navarro, 2017; Tobin et al., 2014). Thus, we believe that this novel methodological approach combining different theoretical lenses helps embrace the complexity associated with the resilience actions developed by communities in response to COVID-19 and climate change.

The paper is organized as follows. After this introduction, in section 2 we discuss the literature focused on the tourism resilience in the context of COVID-19 and climate change. Section 3 introduces the context and case of *Quebrada Verde* as an eco-tourism destination. Section 4 outlines the conceptual model underpinning the study amalgamating two strands: the community resilience model and the social network perspective. In section 5, we outline the methodological approach to the case study. In sections 6 and 7, using our conceptual framework, we discuss the results based on the theoretical perspectives: *community resilience model* and the *social network perspective*. In section 8, we summarize our results, advance conclusions and provide some avenues for future research.

2. Literature review

The importance of resilience has risen in recent years due to an increased number of shocks experienced in tourism and other industries worldwide. As a result, this concept has been adapted to various contexts, including biology, ecology, pedagogy, psychology, and sociology, among others. Some of the most prominent types of resilience explored in the literature entail: the socio-ecological resilience (Islam et al., 2020; McLeod et al., 2021; Cinner & Barnes, 2019; Ruiz, 2011) derived from

the socio-ecological systems approach and used in ecosystem management (Berkes, Colding and Folke, 2002; Fernández, 2017; Sabatinelli and Aguilar, 2018); social resilience (Wickes et al., 2017; Khalili et al., 2015; Lwin et al., 2020; Saja et al., 2021; Wang, Guo y Kuo, 2020); organizational resilience (Salanova, 2020; Reis et al., 2017; Alarcón et al., 2019); urban climate resilience (Tyler & Moench, 2012); and community resilience (Zhang et al., 2020; Rendon et al., 2021; Musavengane & Kloppers, 2020; Uriarte, 2010, 2013; Joseph et al., 2020; Pfefferbaum and Van Horn, 2014; Kirmayer et al., 2009; Pollok et al., 2019). The latter focuses on the examination of community capacities, capabilities, and resources to respond to adverse events (Paton & Johnston, 2001) and is the focus of this study.

There is an extensive literature on community resilience (see Berkes & Ross, 2013). Community resilience has been assessed in the tourism setting by Kirmayer et al. (2009) who examined the impact of adverse conditions on the Aboriginal communities, particularly paying attention to their health and wellbeing. Recently Zhang et al. (2020) have revisited the debate on the importance that community participation has for the environmental conservation of the mountains Nanling in China and its relation to tourism. Similarly, Musavengane and Kloppers (2020) focused on the community-based tourism in South Africa, where the authors investigated the role of social capital in building community resilience through the management of common pool natural resources. They found that ecotourism can generate high levels of social capital, which in turn promotes cultural revitalization and community resilience (Musavengane & Kloppers, 2020). This is important, since the ability to respond proactively to external and internal shocks is crucial for visitation, revenues and overall wellbeing of communities (Turner et al., 2006). Yet, none of these studies considered the community-based approach to COVID-19.

Pappas (2021) and Pappas and Glyptou (2021) highlight the complexity associated with the travel and accommodation decision-making in the context of COVID-19 and Athens, Greece. In their study involving the use of fuzzy-set Qualitative Comparative Analysis, the authors establish that travel, destination and hospitality affect holiday intentions during pandemic. In addition, they find that COVID-19 influences potential travellers differently depending on their age, income as well as the psychological and economic impact that is associated with COVID-19 (Pappas, 2021). Ultimately, both investigations provide useful insights regarding the way communities should deal with the consequences of the pandemic (Pappas, 2021; Pappas & Glyptou, 2021).

While numerous authors consider the impact of the pandemic on broadly understood tourism resilience (see Prayag, 2020), only a few, including Pappas (2021) and Pappas and Glyptou (2021) focus explicitly on the community aspect (see also Sheppard & Williams, 2016; and Pyke, Lacy and Jiang, 2016). Uriarte (2010, 2013) develops a theoretical model of community resilience that emphasizes the importance which a network of social and cultural interlinks between the community members has for building resilience. Indeed, the community's organization plays a crucial role in sustaining common natural resources, since, as claimed by Hardin (1968) without appropriate community management these resources will perish. Ostrom (2009) supports this view arguing that communal self-organization, or the *management of common goods* (Ostrom, 1990) has had great results in achieving the sustainability of its natural resources in the past. Thus, it is the community as a united group of people that can effectively build resilience to societal and environmental hazards, and various capacities of the community should be studied.

Specifically, this model encompasses five dimensions: (i) the cohesive social structure, which is linked to the integration and equality among its members; (ii) the community's trust in the authorities' honesty; (iii) cultural identity, which reflects the customs of the community; (iv) collective self-esteem, which generates appreciation for being a part of the community; and (v) social humour, which highlights the positive even in a crisis situation. This multi-dimensional system

approach is adopted in the context of COVID-19 since the pandemic has been affecting the social and economic factors that influence the community response in a short term, subsequently shaping the resilience strategies in the community of interest.

In contrast to the pandemic, the effects of climate change are constant and will continue disrupting the natural ecosystem of communities. As a result, there is a large volume of the literature concerning climate adaptation and mitigation processes in response to the threat of climate change (the indicative studies include Pyke et al., 2016; Sanogo et al., 2016; Lamsal et al., 2017; Weir, 2017; Anjos & de Toledo, 2018; Moshofsky et al., 2018; Tang et al., 2018; Miranda et al., 2019; Tran & Brown, 2019; Turner et al., 2020; and Petraglia et al., 2020).

The community-based resilience to climate change has been discussed by Tsai et al. (2016), who examined three communities regularly exposed to the threats of typhoons and flooding in Taiwan. They found that the community’s perception of tourism impacts, and in particular its economic impact, is positively correlated with the local capacity for undertaking adaptive responses to climate change. Moreover Amir et al. (2015), discuss factors that contribute to resiliency of rural tourism community in Malaysia. Their findings highlight the importance that sustainable tourism development in rural areas has for improved resilience within local communities, including, although not explicitly, the resilience to climate change.

The present study contributes to the literature on community resilience in the tourism setting in various ways. First, it explicitly examines the resilience strategies of rural communities to both COVID-19 and climate change. As highlighted earlier, this is important since both threats generate a unique set of impacts that affect rural community’s capacity to adapt and recover. To the best of our knowledge, we are the first to specifically analyse the joint impact of these two crises in the context of community resilience.

Second, Rosalina et al. (2021) accentuate that there are no case studies in Peru addressing rural tourism, with only a few such studies in South America. This is important, since Guan et al. (2019) argue that tourists increasingly seek authentic experiences.

Third, the study invokes the *social networks’ perspective* (Lozares et al., 2011; Szreter & Woolcock, 2004) that outlines the networks of the relationship which have been built over time to sustain natural resources

in order to analyse the community’s resilience to the effects of climate change. While this approach has been used in various studies and in different fields related to resilience (Cofré et al., 2019; Hawkins & Maurer, 2010; Navarro et al., 2017; Poortinga, 2012), we believe that this is one of the first attempts to utilize this model in a qualitative research. Specifically, our analysis comprised of Bonding, Bridging and Linking, enables us to capture not only the relationships within the community members (Bonding), but also the (horizontal) relations between different communities or groups (Bridging), and the (vertical) relationship between communities and authorities. By incorporating these social dimensions into the present examination, it is possible to establish guidelines that managers of eco-tourism, including the eco-tourism in the coastal hills, must take into consideration when designing the conservation or mitigation plans in the context of risk situations, such as the current pandemic and climate change.

Therefore, the present study combines the approaches of *community resilience* and *social networks’ perspectives* to explore fully the resilience and adaptive capacities of the rural community of Quebrada Verde, which specialises in the ecotourism offering. As indicated in Fig. 1, this provides theoretical foundations of the present analysis.

The particularities of the community and the study setting are discussed next.

3. Case study and methods

3.1. Case study setting: the community of Quebrada Verde, Perú

In recent years, tourism in Peru, and, in particular, its receptive variant entailing visits from international tourists, has blossomed reaching over four-million visitors only in 2019 (Ministerio de Comercio Exterior y Turismo [MINCETUR], 2020). This large number of tourists was achieved partly as a result of the country’s extensive offer of natural sites and associated eco-tourism. Alongside the Top UNESCO World Heritage Sites in Peru, there are other less known touristic attractions. One of these natural sites are coastal hills (in Spanish *lomas costeras*), on which the present analysis is founded (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2020).

Coastal hills are defined as “... ecosystems with special ecological

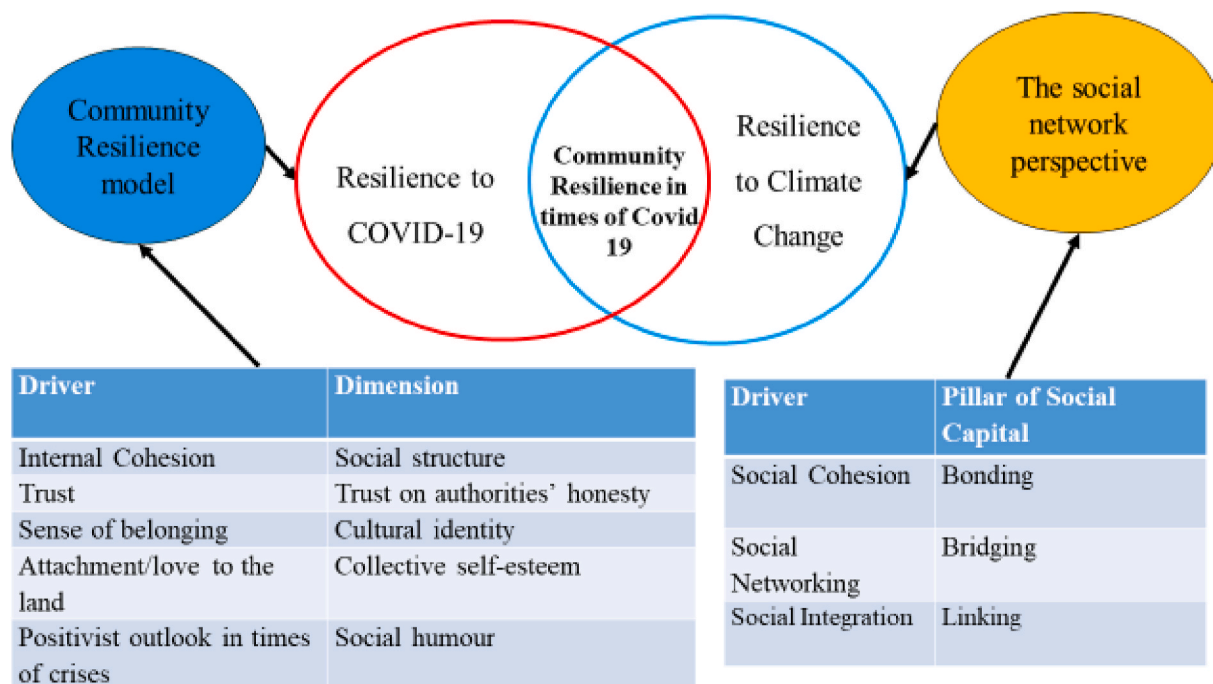


Fig. 1. Conceptual Framework to assess resilience in the community of Quebrada Verde. Adapted from: Lozares et al. (2011) and Uriarte (2010, 2013).

conditions and with vegetation of various types that turns green during winter ...” (Brack & Mendiola, 2004). These hills, which have been labelled ‘fertile belt’ (Johnson, 1976) and ‘oasis of fog’ (Ellenberg, 1979), are home to numerous transient vegetation species that appear “... at the end of May, and last approximately until the end of October” (Pulgar Vidal, 1946). Therefore, the coastal hills are an attractive tourist destination offering services based on their rich ecosystem. These services have been managed under the principles of ecotourism, which allows tourists to enjoy their leisure time while supporting the efforts towards conservation of the environment (Boniface & Cooper, 2005).

That said, frequent changes in the use of land in the city of Lima located in the proximity of the coastal hills imply that these ecosystems are under significant urban pressure. The most exposed ecosystems include the hills of Amancaes, Carabayllo, Mangomarca, Villa María, and the focus area of this study, Lomas of Lúcumo. As documented by numerous authors (Weber & Puissant, 2003; Romero & Vásquez, 2009; Merlotto et al., 2012; Alvarado & Araya, 2013; Ramírez & Pértile, 2013; and; Leija et al., 2016), this is a common problem for peripheries of most Latin American agglomerations. For that reason, the Regional Conservation Area (ACR) called the System of Lomas of Lima was created in 2019 in order to sustain and protect the nature from adverse urban influence.

As shown in Fig. 2, the Lomas of Lúcumo examined in this study are located to the south of Lima. Although the hills do not form part of ACR the conservation efforts to maintain its fragile eco-system is led by an organized community known as Community of Quebrada Verde, which is the first community in Lima to develop rural ecotourism as a tool for protecting the ecosystem of the hills. This offering together with other aspects of the community are affected by COVID-19 and climate change. Thus, this research examines the resilience strategies implemented by the rural community of Quebrada Verde in the Lomas of Lúcumo, whose eco-tourism system has been challenged by these crises.

3.2. Research methods

A case study approach was employed to gain a multifaceted understanding of the town’s context as well as to generate insights that can be applied at similar destinations (Flyvbjerg, 2006). As Yin (2003) emphasizes, a case study is a research strategy rather than a method in itself

and it is useful for providing explanations (how and why) for a given phenomenon. To conduct the case study, a mixture of qualitative methods was implemented in order to gather relevant primary and secondary data. We deployed a qualitative research strategy guided by in-depth interviews and focus groups (Creswell, 2014; Hennink et al., 2010; Hernández et al., 2014; Naupas et al., 2014), which was then complemented by a documentary analysis (Bowen, 2009). For the former, the participants, also referred to as *key informants* (Mendieta, 2015; Seidman, 2006; and; Hennink, 2010), were selected using convenience sampling (López & Fachelli, 2015). This sampling method was suitable as the chosen participants held roles that are representative of their groups. Specifically, the interview participants included two leaders and two members of the Ecotourism Circuit Association (ECA) the Lomas of Lúcumo, two tourism promoters/supporters in the region, and a leader of the Ecological Command Civil Association (ECCA) who for the last ten years has been developing reforestation projects in the Lomas of Lúcumo. It is important to highlight that the interviewed members of the ECA the Lomas of Lúcumo also formed part of the Quebrada Verde community (henceforth, CQV) at the time of data collection.

While the convenience sampling was implemented to identify the participants of the study, the seven selected participants were senior members of the relevant community and expressed an interest in and a commitment to the present research. According to Dworking (2012), this number of participants is sufficient to generate meaningful findings, and it has been selected elsewhere (see Bosher et al., 2009).

Due to the lockdown restrictions, the participants’ interviews were conducted telephonically with a prior agreement regarding the date and timing of the interviews. We recognise that this method of interviews has not been used extensively in the qualitative research (Sturges & Hanrahan, 2004), however, evidence suggesting that it produces lower quality data is lacking. In addition, telephone interviews offer a valuable alternative to face-to-face interviews as a method of data collection in the context of the Covid-19 pandemic. Furthermore, Carr and Worth (2001, p. 521) consider telephone interviews as a ‘versatile’ tool of data collection, while Sturges and Hanrahan (2004) provide a list of advantages that telephone interviews offer in comparison to face-to-face interviews including increased access to participants and increased interviewer’s safety. Thus, while interviewing participants

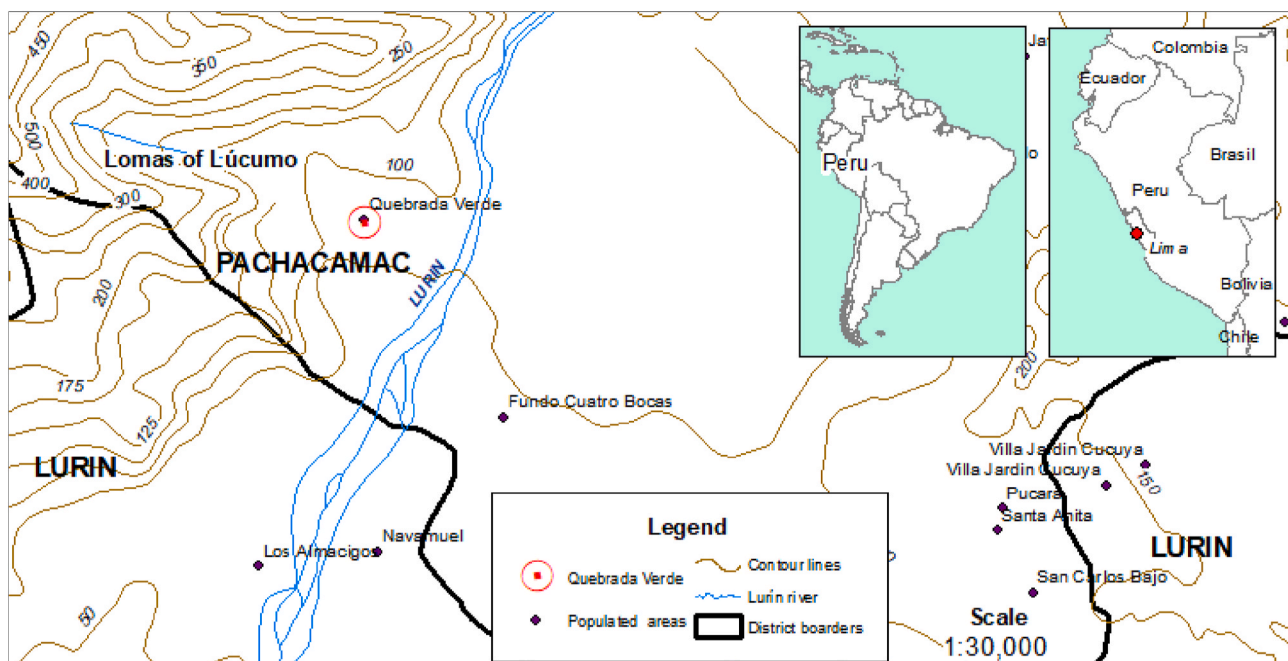


Fig. 2. Lomas of Lúcumo, Quebrada Verde, near Lima, Perú. (Source: National geographic institute of Peru).

electronically may be biased, this approach is favoured given the confinement. Each interview lasted at least 30 min and was recorded with the participants' permission. Moreover, to abide by the rules of confidentiality outlined in the participation consent forms, the seven participants' data were coded as shown in Table 1. When discussing the interviews in sections 6 and 7 we refer to the code for the key participants as stated in Table 1.

The interview stage was followed by the "focus group discussion" (Hennink et al., 2010), which consisted of the use of a thematic script to facilitate an open dialogue regarding the response to various threats faced in the Lomas of Lúcumo. The focus group technique was developed with biosecurity measures in place to prevent the spread of the virus. This was possible as the Peruvian government relaxed the quarantine restrictions at the time the focus groups' discussions were carried out.

As it is depicted in Fig. 3, the responses obtained through the in-depth interviews and the focus groups were scrutinized using Discourse Analysis (DA) (Van Dijk, 2005). This method consists of identifying patterns in the participants' responses in order to analyse and relate them, ultimately determining common attributes and categories (Hennink et al., 2010). The discourse analysis points to the synthesis of and links between descriptive arguments (Gerring, 2012), thus, facilitating meeting the objectives of the present study. Due to the current circumstances and the pandemic impact in all spheres of society, we believe this type of research device to fit the purpose of our study in that DA is 'not just a mirror on the social world around us but in many ways plays a key role in producing the world. [...] In so doing we have and impact on others' perceptions and understandings and as such on their and our reality' (Bryman & Bell, 2007, p. 536).

To complement our examination, we employed documentary analysis (Peña & Pirela, 2007) to extract substantive content from previous research and publications embracing the three main themes of the present study: the COVID-19 pandemic, eco-tourism, and climate change in the Lomas of Lúcumo. While this method was primarily applied to build the conceptual framework of the present research, it was also used to inform the preparation of the interviews and focus groups' script, and in the discourse analysis. The presence of this methodological technique at all stages of this research is shown in Fig. 3, which summarizes the methods of the current research.

The methodological strategy adopted in this study followed these stages: (1) Review of relevant literature and designing conceptual framework. The process began in March 2020 with the UK-Peru project team discussing and reflecting on the theoretical and conceptual framework underpinning the study and agreeing upon the choice of the community resilience and the social network perspectives as the two main pillars. The literature review included review of documents, articles, books and specialized web platforms; this allowed the identification of key informants. (2) Interviews: Because of the confinement situation, due to the COVID-19 pandemic, the interviews were conducted in June 2020 by telephone with advance coordination and permission for recording. (3) Focus Groups: On the July 1, 2020, the Peruvian government temporarily lifted the confinement so, interviews were conducted face to face and focus groups [See Appendix 1] were developed in this month to deepen the gathering of information. (4) Information from interviews and the focus group was transcribed and studied using the discourse analysis technique. The study was completed in September 2020.

Table 1
Coding of participants/key informants' data. Source: Authors' own elaboration.

Group of key informants	Number of key informants	Code
Quebrada Verde Community representative	4	CQV
Regional Tourism Promoters	2	PT
Ecological Command Civil Association	1	CE

4. Results and discussion

4.1. Resilience

In this section, we discuss the results of the interviews using the first of the pillars of the conceptual framework proposed in section 2, *Community Resilience Model* as illustrated in Fig. 1.

Using Uriarte (2010, 2013)'s five dimensions (*social structure; trust in the authorities' honesty; cultural identity; collective self-esteem; and social humour*) of the community resilience, in the following sub-sections we discuss the responses of the members of Quebrada Verde community to the policies imposed by the Peruvian government amid the COVID-19 pandemic.

4.1.1. Social structure

The community exhibits a cohesive social structure evident through the members' common historical ancestry rooted in the families of ranchers and farmers who began the settlement in the Lomas of Lúcumo many decades ago. In this regards, the leader of the CQV mentions:

"... The community of Quebrada Verde emerged as a group of shepherds, who came from the so-called mountains of Lima, including Huarochiri, Santayan, and Ollero, in search of the pastures on the hills. They were later joined by the farmers from Pachacamac, who grew their crops on the banks of the river, and decided to live here too ...".

This indicates that the current inhabitants partially come from the families of ranchers, who were migrating from the Andean areas of Lima seeking pastures for their cattle in winter, but returned to their usual habitat in summer. People exhibiting this pattern of migration are referred to (in Spanish) as *transhumantes*. Other habitants of the community attribute their descent to the families of farmers from the lower valley of the Lurín river, who chose to occupy the hills in effort to expand their territory. These common roots nested in the families of ranchers and farmers and maintained for over one hundred years compose the current socio-cultural structure of the community.

The common historical bond between the members of the community and their joint exposure to disastrous events in the past have allowed them to develop essential adaptability skills. According to the CQV's key informant, over the years the community of Quebrada Verde had faced a number of disasters, including the earthquakes in Lima in 1940, 1974 and 2007, the El Niño phenomena of 1983, 1998 and 2017, and the influenza A (H1N1) pandemic in 2010. Their joint exposure to these adversities has encouraged the development of social ties, which further reinforced their sense of belonging and inclusion. Therefore, when the Peruvian government imposed prevention measures against COVID-19, all community members jointly and severally obeyed them, as stated by the key informant from the CQV:

"as a community we are trying to respect the rules, and stay at home ...; people go to work only upon presenting the work permits issued by the state".

For the population of the rural town centre of Quebrada Verde, the term 'community' refers to people of common ancestry occupying a particular territory, who collaboratively generate plans and projects concerning their town's future. Eco-tourism is one of the projects that materialized with the Ecotourism Circuit Association (ECA) the Lomas of Lúcumo, which emerged as a Tourism Commission in 1996, when tourism was still an incipient activity in the country.

The CQV key informant confirms this information stating:

"... One of these commissions was the Tourism Commission. In those years it was a bit funny to say 'tourism' in Quebrada Verde".

When the Lomas of Lúcumo had first been listed in the country's touristic calendar in 2003, the members of the commission decided to formalize their activity, and became formally recognized as a legal

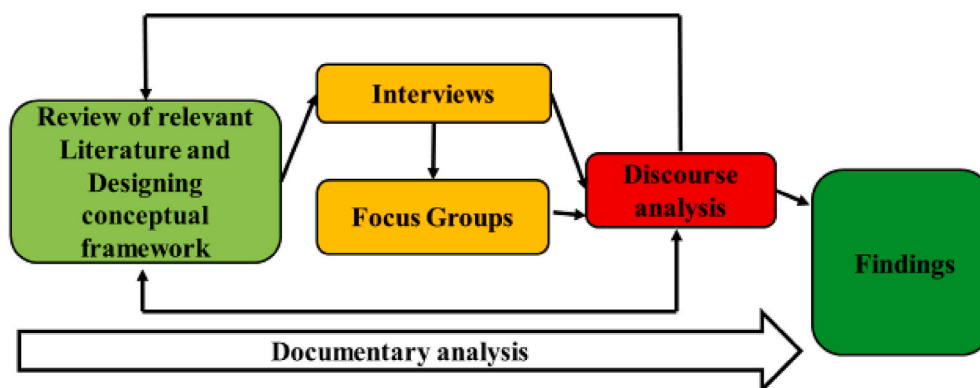


Fig. 3. Methodological Stages of the study.

entity in 2009. This enabled the commission to implement important developmental proposals, which continue. One of the targeted objectives includes achieving a sustained growth in the number of national and international tourists visiting the Lomas de Lúcumo, which, according to the local report, reached 26,184 in 2018. This number of visits was obtained through the skilful management of the community's authorities that subsequently generated the sense of recognition and representation among the community members. A system of democratic participation in the election of the authorities facilitates the organizational structure of the community, and it is described by the key informant of the CQV as follows

"Voting takes place every two years with one or two lists of candidates being presented to voters. Then one of the lists is chosen".

4.1.2. Trust

The outlined democratic process in the community of Quebrada Verde combined with the fact that the Lomas de Lúcumo are one of the places with the highest demand from national and foreign visitors have enhanced the confidence that the members of the association and the community deposit in the efforts carried out by the authorities. This particular aspect strengthens the community's resilience in that it encourages the members to accept and respect the decisions made by the authorities. This entails several difficult and contentious decisions made by the Peruvian government, including the government's resolution to impose the lockdown measures amid the COVID-19 pandemic. These measures have been particularly constraining as the confinement of houses and prohibition of any forms of social gatherings significantly paralyzed the local eco-tourism. As the key informant of the CQV admits *"... at first it was a bit uncomfortable, but now everyone is moving forward"*.

4.1.3. Cultural identity

The cultural identity of the community, beyond the common element of ancestry, is rooted in the community members' customs, including a joint celebration of the Fiesta del Santísimo Cruz de Madero of Quebrada Verde, which is a religious congregation celebrated every year since 1948. Due to the COVID-19 related safety measures, the 2020 celebration has been cancelled, as outlined by the key informant of the CQV

"... this year the traditional festivals will not take place. This includes the Fiesta del Santísimo Cruz de Madero that is held every year in September".

Similarly to the *Fiesta del Santísimo Cruz de Madero*, the opening of the tourism season that has been celebrated in the community since 2003, has been cancelled.

Another aspect that underpins the cultural identity of the Quebrada Verde community is the inclusion of topics and activities directly related to the Lomas de Lúcumo in the curriculum of the only school in the town.

This connection of the school to its cultural heritage is important for the community members as it transcends the territorial ties and converts them into the ties of solidarity. The latter is evidenced in the context of the COVID-19 pandemic, during which, the community has been carrying out various humanitarian aid actions in support of the most vulnerable members of the local population. The key informant of the CQV gives further detail:

"... there are some neighbours who are economically doing a bit better than others ... they have shared. I think that before COVID-19 that was not necessarily the case, but now it is happening because of the affection and love that one has among the neighbours".

4.1.4. Collective self-esteem

The Lomas de Lúcumo is not only an important tourism attraction in close proximity to Lima, but simultaneously it plays a key role in the community's collective self-esteem, where the image of the hills forms an integral part of how the community members are associated with each other. This is explained by the CQV key informant, who states *"... the hills became the foundation of the community's identity ..."*. This implies a feeling of belonging to and pride of the place that converted into a vital part of the community members' life. This inherent feeling of appreciation and love towards the land, the place where members of the community were born and have lived together, is what Tuan (1990) refers to as *topophilia*. As a result, migration is an idea decisively rejected by the members of the community despite the economic struggle caused by the pandemic. This opinion is reiterated by a number of the key informants of the community, saying

"... No, I would not leave this ...". "No, because I have my house here, and it is difficult for me to leave Quebrada Verde ...". "... People here suffered a lot, but they stayed nonetheless". "People would always find alternatives to migrating. I don't think they would leave because as far as I know they are very entrepreneurial people ...".

These affirmations reflect a high collective self-esteem among the community members, expressing their pride of their common territory and various ecosystem services offered by the hills. This aspect is crucial for the community resilience, since it shapes the members' outlook on the approaching economic recovery planned for September and October. Specifically, these are the opening months for the tourism season, which happen to coincide with the announcement regarding the lifting of numerous social and economic restrictions dictated by the Peruvian government amid the pandemic.

In addition to the mentioned attributes of the collective self-esteem among the members of Quebrada Verde community, the sustained increase in the number of tourists visiting the Lomas de Lúcumo in recent years has permitted the local families to earn additional income. This, in turn, helped them reduce the impact of the economic crisis caused by the

pandemic. According to the key informant of the CQV

“... the population’s economic situation has considerably improved compared to past years. There are still some families that struggle economically, but this group is very small in comparison to the proportion of families that are able to cope financially during the pandemic. This surprises me because in the last 27 years I have not seen such an economic growth in the area ...”.

4.1.5. Social humour

As part of the social humour dimension of the community resilience, which intends to bring up positive aspects of negative developments, a period of rest from a human influence has been proclaimed for the Lomas of Lúcumo. Since national and foreign tourists were advised against travelling, the local ecosystem became less exposed to the accumulation of solid waste and noise, among other things. As the key informants of the CQV and PT acknowledge:

“... we are giving the place a break”, “... now that the nature is again in a good condition, I would not be surprised if the Lomas of Lúcumo are also in a good condition because of the limited human presence ...”.

Moreover, the community members see the confinement of home as a positive outcome of the pandemic offering them more time to spend with the family. This has been reiterated by the key informants as follows:

“... but with everything that has happened, not everyone is going to work, only some people. So, more time is spent with the family and more time is shared ...”. “... It has made us reflect and appreciate what we have. We should be and are in solidarity with the rest of people ...”. “This situation created a union of people, which was necessary for a long time and teaches us to take care of the neighbours”.

The analysis of the five-dimensions of the Quebrada Verde community resilience reveals a high level of adaptation to the pandemic. This is achieved through appropriate organization and management skills of the community members and their inherent topophilia. While the community is able to counteract the temporary effects of COVID-19, the next section studies whether equally successful community’s risk management strategies are implemented in the context of climate change.

4.2. Social network

The set of ideas underpinning the conceptual framework proposed in section 2, considers the interaction of elements in social network as keys to illuminate the reliance of a particular community. In this section, we use the *social network model* as proposed by Lozares et al. (2011) to evaluate the resilience of the Quebrada Verde community to climate change.

4.2.1. Bonding

Bonding is the pillar of social capital that synthesizes the various horizontal relations developed in a community and is important for immediate support in a community (Hawkins & Maurer, 2010). We can argue that the Quebrada Verde community clearly manifests social cohesion or ‘Bonding’ through its well-defined cultural identity, which is reflected in its *topophilia*, as well as in its sense of belonging and preservation of customs. As already mentioned, the community is characterized by a common historical ancestry, which distinguishes it from other communities located in the close proximity. During the pandemic, members of the community helped each other out, thus, manifesting the presence of trust, reciprocity, recognition, and legitimacy. All these values support the aspect of social cohesion in Quebrada Verde.

The social cohesion that the community maintains is also reflected in the Ecotourism Circuit Association (ECA) the Lomas of Lúcumo, which, with an exception of a few acquired members, is entirely made up of the

members of the Quebrada Verde community. This is echoed in the following statement of the ECA leader, who explains:

“... only 3 people are not from the community because they either came to volunteer in the reforestation project or they came to teach history in the school ...”,

This statement reassures that even those individuals have a close relationship with the community. Concerning its structure, the association consists of founding and non-founding members who play different roles in the community tourism management. The CQV member confirms that

“... there are categories of members ... the founding partners who are responsible for attending the assemblies and preparing the reports; then, the partners who are tourist advisors ... in charge of keeping the association active; ... and we also have eco-tourism advisers who are not members. They are mostly formed of young people who have just joined us ...”.

Thus, the organizational structure of the association together with its common cultural identity suggest a high level of internal social cohesion between the members, thus, influencing the tourism management activities implemented by ECA.

This internal cohesion of the community is fundamental to cope successfully with the effects of climate change. For example, in the recent years the community has been developing educational activities to protect the environment, including issuing of sustainability messages for the visitors’ induction. These messages entail various signs and communications about the conservation of the flora and fauna of the Lomas of Lúcumo, which propagate valuable environmental practices. Furthermore, the reforestation activities in the area have been conducted in the community for several decades. The purpose of reforestation is to store water from mist or rain, so that the natural resources offered to tourists are conserved when the threat of desertification occurs. This is also what the member and leader of the CQV claims:

“... when we have had years with more humidity we had been counteracting with appropriate seedlings, and since we have grown many new plantations in the most arid areas ...”.

The reforestation projects are essential for preserving the condition of ecosystem in the Lomas of Lúcumo and are undertaken to this day by the community members working collaboratively with other institutions.

For a possible scenario in which climate change significantly affects the vegetation and biodiversity of the Lomas of Lúcumo (Eusebio et al., 2006) the community leaders have identified other local resources attracting tourists. Specifically, the alternative offering entails a series of pictograms (rock paintings) and petroglyphs (engravings on rocks), which are jointly referred to as *rock art* or “Quilcas” (Echevarría, 2011). They illustrate the scenes from lives of the area’s first settlers, and they belong to the local collection of cultural inheritance from the pre-Hispanic times (Echevarría, 2011). Furthermore, the coastal hills are rich in a variety of geomorphological formations resulting from the erosion and weathering, which occurred due to high levels of humidity and precipitation. These can be found along the numerous routes of the hills, such as those along cliffs and ridges, and are a rare attraction for the visitors. This alternative offer shows that the community has the capacity to promote and use other tourist resources, thus having the ability to adapt to climate change and ensure social cohesion.

4.2.2. Bridging

According to the model of social network perspective, bridging is the element that brings the relations between different communities or groups. In this regard, Quebrada Verde community clearly maintains ‘Bridging’ has been exercised via the links with the ecological group Ecological Command Civil Association (henceforth ECCA), with whom it has been developing the already mentioned reforestation activities since

2001. The ECA leader reports

“... we began the project in 2010 but only in 2011 the first reforestation activity was completed Reforestation takes place every year ...”.

Since 2011, ECCA has been annually planting the keystone species of Tara and Huarango trees, complementing the forests that the community started growing many years ago. The new plantations contribute to the beauty of the landscape of the Lomas of Lúcumo, making it its main tourist attraction. More importantly, these types of trees capture CO₂ and store water in the winter, strengthening the ecosystem of the area threatened by climate change.

In addition to the aforementioned projects, the community of Quebrada Verde has been carrying out some tourism-focused negotiations with other local associations that manage the coastal hills in the proximity of Lima. These young associations form part of the ACR System of Lomas in Lima and their ecotourism offer is still in an incipient stage. Specifically, the community with the coordination of the Ecotourism Circuit Association Lomas of Paradise has recently raised their concerns regarding the status of the tourist guidance. This was facilitated using the fact that the Lomas of Lúcumo and the Lomas of Paradise are part of the same ecological system, which has been fragmented by the processes of urbanization in the city of Lima. The tourism promoter of Loma of Paradise explains:

“... the guides of the Lomas of Lúcumo are supported by the guides of the Lomas of Villa María It is a single ecosystem, formerly known as the Lomas of Atocongo, which have been separated by the city over time This association is in charge of carrying out ecological and eco-tourism activities in the Lomas of Paradise, located in the Villa María del Triunfo district, north of the Lomas of Lúcumo. For this reason it is also known as the Lomas of Villa María”.

Despite these initiatives, greater social ties between the community and other stakeholders that form part of the System of the Lomas of Lima are necessary, as all these institutions share common risks, including the threat of urbanization due to the growth of the city of Lima, increase in crime due to the land trafficking and the threat of climate change. The ACR System of the Lomas in Lima must strive to achieve a greater coordination between these associations and joining efforts towards common objectives.

The Lomas of Lúcumo is connected by means of the Lurín River with a number of other tourist attractions, such as the Archaeological Sanctuary of Pachacamac that promotes archaeological and historical tourism; the communities of Guayabo and Flintstone that specialize in the agro-tourism offer; and the towns of Cieneguilla and Antioquia, which offer rural tourism. For this reason, a proposal of diversified tourism in the Tourist Circuit of the Lurín River Valley would enable the Lomas of Lúcumo establishing closer social links with other organizations and institutions. The initiation of both tourist circuits, which form part of key tourist destinations in the south of the city of Lima, would connect the community of Quebrada Verde with other tourism organizations and institutions, thus ensuring the presence of external resources and assistance in the face of risk generated by the change of climate. Navarro et al., (2017, p. 466) confirm this by acknowledging that:

“... information flows through groups increasing their ability to learn and adapt given the innovations that circulate on the network”.

4.2.3. Linking

Linking in the social network model denotes social or vertical integration. Our investigation suggest that members of the Quebrada Verde tourism management have been facing some difficulties in integrating its activities. Quebrada Verde is located within the jurisdiction of the district municipality of Pachacamac, the metropolitan municipality of Lima, and the Ministry of Foreign Trade and Tourism (MINCETUR) in Peru. Since the authorities of the municipality of Pachacamac change

every four years and in the past have been prioritizing urban infrastructure projects over eco-tourism, the community of Quebrada Verde does not undertake joint efforts and plans with this municipality. This weakness is further highlighted by the CQV leader stating

“... we are a bit isolated from the municipality ... they do not approach us ... we would like the municipality to be closer to us because it is the local authority ...”.

Unlike the municipality of Pachacamac, the metropolitan municipality of Lima maintains closer link with the community of Quebrada Verde, which is reassured by the CQV leader stating “... now we have a fairly strong connection ...”. The connection is manifested in the joint efforts that have been put into the project “*Conservation, management and rehabilitation of the fragile ecosystems of lomas*”, which the metropolitan municipality has been further developing in a cooperation with the United Nations Development Program (UNDP), the Service of Natural Areas Protected by the State (SERNANP) and the Global Environment Fund (GEF). The project aims to develop adaptation mechanisms based on ecosystems, and it is also known as “EbA Lomas”. One of the objectives of the project is to work under integrated management on the resilience of coastal hills to climate change. This implies that communities and associations play a vital role in achieving the objectives. The Lomas of Lúcumo and the Quebrada Verde community are part of the intervention area that this project targets, henceforth, creating close social links between the community and the metropolitan municipality. The success of the project is difficult to envisage as it significantly depends on human and political factors. In particular, the inevitable changes in the governing bodies may lead to an alteration or even a termination of the project pursued by the political authorities currently in power.

Apart from these initiatives, The MINCETUR has implemented the program “*National Strategy for Rural Community’s Tourism*” that has been promoting tourism in rural communities since 2007. Despite being part of the program, the community of Quebrada Verde and the Lomas of Lúcumo remain inescapably exposed to the effects of climate change, which lie beyond the scope of the program. In particular, the institutional framework focuses on tourism marketing and financial profitability, and offers to the members of Quebrada Verde community training centered on these aspects. Had the Lomas of Lúcumo been recognized as an ACR or a Natural Protected Area under the jurisdiction of the Ministry of the Environment of Peru, projects focused on ecological and community resilience to climate change could have been developed. However, so far only a single hill in Peru, the Loma of Lachay, has gained this prestigious and advantageous status and became the Protected Natural Area.

5. Conclusions

The analysis of the eco-tourism resilience for the community of Quebrada Verde points to mixed results. On one hand, numerous tangible and intangible adaptive skills and capacities of community members are identified, which strengthen their ability to counteract the COVID-19 pandemic. Specifically, the insights derived from the evaluation of the five dimensions of community resilience model point to advantages of self-organization, discipline, democracy, solidarity, topophilia, self-reflection and appropriate community management in Quebrada Verde. All these elements are a clear example of what [Ostrom \(1990\)](#) calls a *common property management*, and which has allowed the community to be resilient to the social and economic effects of the COVID-19 pandemic. This and the fact that global efforts have been made to develop the vaccination to the coronavirus suggest that the community will be able to recover in a short term ([Uriarte, 2010](#)), most likely by 2022. This would enable the community to re-establish their eco-tourism offer and anew attract a high number of visitors.

However, the pandemic is not the only adversity that the Quebrada

Verde community has been recently faced with. While the pandemic has not been directly affecting the ecosystem of the coastal hills, climate change has. Indeed, it is evident that the effects of climate change are not only having more impact on the eco-tourism system, but are also more lasting. For that reason, we adopted the social network perspective to better understand the impact of climate change on resilience in the Lomas of Lúcumo.

Specifically, the analysis of the social cohesion between the community leaders and the association with its members that the community of Quebrada Verde is characterized by a robust social bonding. This relationship has played an important role in the community's successful tourism management in the Lomas of Lúcumo, as it facilitated the resilience to the effects of climate change by means of various adaptation measures, such as the reforestation and the identification of alternative tourist resources. Undoubtedly, the same success has not been achieved in the context of Bridging, which refers to the community's relationships with other institutions and associations that share the same interests and problems. Although it is tempting to claim that social integration with the local government authorities, hence, *Linking*, has been opportunely practiced by the community, the evidence suggests otherwise. According to Navarro (2017, p. 466) sustained in Newman and Dale (2004) "when bridging-type links are absent, it is difficult to assimilate the innovations necessary to adapt to changes due to social restrictions and low diversity (...), thus leading to low resilience". Thus, further consolidation of successful social integration over time is necessary to permit the community to undertake initiatives to counteract climate change through the different phases of risk management, such as prevention and reaction.

The findings of this study should be interpreted cautiously. The first set of limitations of the results are linked to the fact that the team have to act under the restricted conditions brought by the covid pandemic situation. Under total lockdown ordered by the government meant that at the initial stages of our investigation, the initial interviews were conducted via telephone, which limited possible full and comprehensive understanding of the situation. Later on when the restrictions were partially lifted and despite the willingness of the leaders the focus groups were also performed under social distancing conditions which prevented a much freer and relaxed environment. The second set of limitations are related to the methodology and conceptual framework adopted in this study. We are aware that the lenses through which we explore the response of the community was via the amalgamation of one of many

community resilience and one particular perspective of social network development. Using other combinations might have resulted in different results and indeed this can be a research avenue to pursue in the future as well as studies related to community identity for the development of eco-tourism in rural areas similar to the one studied here.

This study analysed the resilience of a rural community in Peru and its nature-based tourism offering to the COVID-19 pandemic and climate change. Although a large volume of literature centered on resilience has addressed the community's adaptation to climate change, there is only a handful of studies that consider the impact that the recent coronavirus outbreak had on community's resilience strategies. Hence, this study jointly examined the resilience and adaptive capacities of the Peruvian community Quebrada Verde in the tourism destination known as the Lomas of Lúcumo to these two widely different socio-ecological threats.

The results of this study indicate that community resilience and social networks are strategies that tourism managers of vulnerable natural ecosystems must adopt for an adequate process of disaster risk management. This is primarily the case, since tourism is exposed to multiple threats, each one with variable impacts over time.

It has been evidenced that the community retain a cohesive social structure, has a solid cultural identity rooted in its customs and traditions, and possesses social humour that enables it to see the positive aspects of adversity. All these characteristics are essential for building community resilience, and have equipped the community with the strength to embrace and counteract the negative socioeconomic effects of the COVID-19 pandemic. However, we found that the community's resilience could further be enhanced by expanding social networks of cohesion, linkage and integration to ensure the development of strategies for resilience and adaptation in the context of adverse long-term scenarios, such as climate change. In particular, stronger links must be developed with other stakeholders to pursue their joint resilience goals. The challenge involves engaging authorities, which prioritize infrastructure plans related to urbanization to eco-tourism initiatives. Only by consolidating the involvement of key stakeholders, the community of Quebrada Verde can undertake initiatives to counteract climate change through appropriate risk management measures, thus, sustaining its eco-tourism offering.

Declaration of competing interest

None.

APPENDIX 1

FOCUS GROUP: Peruvian team interviewing leaders of Quebrada Verde Community. (18th July 2020).



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