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# Resilience and Community Management of Ecotourism Associations in South American Cloud Oases

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**ABSTRACT**

The coastal fog oases, known as Lomas, are distinct ecosystems that play a vital role in supporting community-based ecotourism initiatives, providing both economic and social benefits. However, these community associations have faced significant challenges due to the COVID-19 pandemic, necessitating a process of adaptation to continue their operations. This study aims to analyze the key indicators developed by two ecotourism community associations in Peru to enhance community resilience during the pandemic, focusing on the three critical phases of disaster management: pre-disaster, response, and recovery. The findings seek to facilitate the replicability and improvement of strategies in other community associations within the Peruvian Lomas Network, as well as in similar organizations worldwide that are connected to ecological systems. To gather comprehensive insights, focus groups and interviews were conducted with representatives and members of the participating community associations, as well as individuals from the Peruvian Lomas Network. The analysis revealed that the most influential indicators of community resilience were a strong sense of community, active participation, and robust social support. In contrast, factors such as educational attainment, demographic data, coping strategies, and improvisation exhibited less impact on resilience outcomes. The study concluded that while these community associations demonstrated commendable resilience in navigating the pandemic, there is a critical need to enhance internal coordination and foster collaboration with local authorities to further strengthen their efforts and ensure sustainability moving forward.

## 1. INTRODUCTION

In recent years, the tourism sector has experienced substantial growth, becoming a crucial driver of economic development in rural regions. This expansion has played an essential role in supporting local communities by providing a range of economic, social, and environmental benefits. At the heart of this progression are sustainable tourism strategies, which emphasize responsible resource management, along with improvements in infrastructure and healthcare services. These advancements are not only vital for fostering tourism development but also for improving the overall health and well-being of local populations, thereby creating a synergistic relationship between tourism and community development [1, 2].

Peru serves as a compelling case study for this phenomenon, given its diverse natural environments, ranging from the high Andean wetlands, known as "bofedales," to the unique coastal fog ecosystems referred to as "Lomas" [3]. The Lomas, located along the Andean foothills, flourish due to coastal mists and sustain a wide variety of species, many of which are endemic to the region [4]. These ecosystems are not only ecologically significant but also hold considerable potential for sustainable tourism activities.

Recent studies underscore the important role that ecotourism plays in supporting and preserving the Lomas ecosystems. The increasing popularity of these areas can be attributed to their rich biodiversity, which is fostered by the unique climatic conditions of the region. This has heightened awareness among local populations and governmental bodies about the need to conserve these areas, not only for their biological diversity but also for the critical ecosystem services they provide, such as water retention and carbon sequestration. As a result, there have been growing calls for focused government action on strategic land planning to mitigate environmental risks and promote sustainable development within these rural communities [5, 6]. Moreover, there is a strong push for enhancing community-led initiatives aimed at protecting these ecosystems from harmful practices, including wildlife trafficking, illegal logging, and unsustainable land use

[7-10].

This research is justified by the growing importance of ecotourism as a driver of sustainable development in rural regions, especially in countries such as Peru, where unique ecosystems such as the 'Lomas' offer economic, social and environmental opportunities for local communities. As the popularity of these areas grows, it is critical to understand how community associations can manage resilience to crises such as the COVID-19 pandemic, and how sustainable tourism strategies can contribute to both environmental conservation and the well-being of local populations.

The primary objective of this study is to analyze the key indicators developed by two ecotourism community associations in Peru to manage community resilience during the three phases of the COVID-19 pandemic: pre-disaster, response, and recovery. By examining these indicators, we aim to identify areas for improvement and apply these insights to broader community-based efforts. Furthermore, this study seeks to emphasize the critical roles of community engagement and government support in enriching the depth and effectiveness of ecotourism initiatives.

## 2. LITERATURE REVIEW

The concept of resilience has gained prominence as a fundamental framework in crisis management, showing how societies use it to regain equilibrium after adverse events. This approach has led to a better understanding of the response capacity of different sectors, categorised into forms such as social, organisational and community resilience. Each of these forms offers specific tools for adapting to and coping with shocks, and are essential in preparing for and responding to unforeseen crises. In particular, social resilience encompasses cohesion among individuals and communities, facilitating cooperation and mutual support in times of emergency [11-14].

Community resilience, on the other hand, focuses on the strategies that communities adopt to cope with shocks arising from social and environmental factors. This type of resilience is crucial in protecting livelihoods and preserving the overall well-being of affected populations. In the aftermath of natural disasters and other crises, numerous studies have investigated the capacity of communities to cope with emergency situations, highlighting the central role of this resilience in the tourism sector. In this context, rapid and effective adaptation has been key to ensuring the economic and social recovery of tourism-dependent regions following disruptive events [15-21].

From an ecological perspective, resilience is viewed as an ecosystem's ability to maintain its functions despite disturbances [22]. Although the pandemic has not directly damaged the natural resource base for ecosystem services, its significant impact on the socioeconomic dimensions, particularly tourism, has been significant. In disaster management, Khalili et al. [23] define a disaster's lifecycle into three stages: pre-disaster preparation, emergency response, and post-crisis recovery. This framework highlights several critical factors for resilience, including community involvement, education, information sharing, learning, information sharing, social support, sense of community, trust, coping style, demographic information, improvisation and resourcefulness, leadership, community efficiency, and coordination.

Ostrom [24] discusses the self-organization among resource users. The effectiveness of the management approaches is influenced by multiple factors: the scale and productivity of the resource system; the predictability of system dynamics; the quality of leadership; the mobility of resource units; the user population size; insights into socio-ecological system interactions; prevailing social norms and capital; and the frameworks governing collective decision-making. Ostrom posits that the durability of sustainable practices depends on the synergy among the resource system, its units, and the users. Supporting this, Musavengane and Kloppers [19] highlight three critical factors affecting community resilience: governance, which includes issues of power misuse and exclusion; financial resources; and the capability to manage and conserve tourism infrastructure.

During the COVID-19 pandemic, Sharma et al. [25] point out that strategic collaboration between various actors, such as market forces, government agencies, technological innovations and skilled professionals, has been key to driving the transformation of the tourism sector. This collaboration not only allowed the industry to survive during the crisis, but also opened the door to a more sustainable and inclusive model. The integration of socially responsible and environmentally friendly practices has been fundamental in overcoming the structural deficiencies prior to the pandemic, promoting a more resilient tourism adapted to the new global demands for sustainability and equity. In addition, the need for long-term strategic planning has been highlighted to ensure that the sector maintains its commitment to responsible development and social welfare in the future.

## 3. METHODOLOGY

Figure 1 shows that the research of this study focuses on the suburban areas of Lima, the capital of Peru; specifically the Lomas of Primavera in Carabayllo and La Bella Durmiente in Independencia. We used qualitative techniques to explore community interaction and the application of solutions to local issues.

To carry out this research, a mixed methodology combining semi-structured individual and group interviews, together with active participation in community activities, was used. This approach allowed us to gain a deeper understanding of the complex social dynamics and structures as described by Hamilton and Finley [26]. Between November 2020 and January 2021, we engaged with a sample selected through convenience sampling, following the methodology described by López-Roldán and Fachelli [27]. The selection of participants was purposive, focusing on those who represented diverse views within the community. During this period, we administered a total of ten questions, thoroughly validated to ensure relevance and consistency with the study objectives, allowing us to capture participants' subjective perceptions and experiences with greater depth and accuracy.

We also conducted two Zoom focus groups to facilitate idea exchange, supported by Caporale et al. [28]. Table 1 shows the participating groups and their characteristics, the initial discussion involved two delegates from the Lomas of Carabayllo, while the second session included four members from the Lomas of Independencia. These were supplemented with in-depth Zoom interviews with leaders from the Lomas of Carabayllo, Lomas of San Juan de Lurigancho, and the Ecotourism Circuit Lomas of Paraíso (Villa María del Triunfo).

Our analysis aimed to identify community resilience indicators during various crisis stages (pre-crisis, response, and recovery), as delineated by Khalili et al. [23]. We examined responses from the focus groups and interviews through discourse analysis, using a coding system to identify and categorize key themes, as outlined by Hennink et al. [29].


**Figure 1.** The geographical focus was on the Lomas of Carabayllo and Lomas of Independencia

**Table 1.** Participant coding

| Participant Group | Number of Participants | Position / Role | Code |
|---|---|---|---|
| "Ecological Association Lomas of Primavera (Lomas of Carabayllo)" | 3 | President, Members | AELP1-3 |
| "Scientific Cultural Association Apu Ikiri Warmi- Lomas of Amancaes Bella Durmiente (Lomas of Independencia)" | 4 | President, Vice President, | ACCAIW1-4 |
| "Member, Association Ecotourism Circuit Lomas of Paraíso" | 2 | Board Member, President | RLP1-2 |

## 4. RESULTS

### 4.1 Before the onset of the COVID-19 pandemic

Active engagement has significantly shaped the development of Carabayllo and Lomas of Independencia. In Carabayllo, the pivotal Union and Force Lomas of Primavera group address nutritional deficiencies, supporting about 200 individuals. Independencia's lack of ecological awareness about the Lomas has led to activities that harm the local ecosystem.

Communication and knowledge exchange are critical. These groups recognize the need to understand their communities' unique needs and preferences before developing effective communication strategies. The Lomas of Independencia benefit from external involvement by entities like the Peruvian Network of Lomas and EBA Lomas, and supported by a United Nations initiative, have conducted educational workshops.

Established in 2013, the Carabayllo Lomas Association celebrates the Lomas' natural allure, emphasizing their role as recreational and ecological sanctuaries. Meanwhile, the Independencia Hills Association stresses these areas' importance as critical 'natural lungs,' vital for inhabitants' wellbeing.

In both locales, trust is fundamental. Carabayllo residents trust a mayor committed to health and nutrition initiatives. In Independencia, enhanced collaboration has strengthened community ties and raised their profile.

Poverty, overcrowding, and inadequate basic services are significant demographic challenges in these regions. Nevertheless, both communities show resilience and innovation in addressing land encroachment and trafficking issues. Notably, Carabayllo implemented Ordinance 398 to protect the Loma of Primavera, leading to several evictions to preserve the ecosystem.

Leadership is crucial in these community associations, with leaders like AELP1 spearheading efforts to address various needs, including health crises.

### 4.2 Community resilience during the COVID-19 crisis

The COVID-19 pandemic underscored the importance of strong community ties, particularly within grassroots organizations. In Lomas of Carabayllo, a spirit of altruism emerged as a key element in addressing the local population's urgent needs. Meanwhile, Lomas of Independencia concentrated on revitalizing the district and creating new

social opportunities. Both groups exhibited a heightened collective self-awareness and a profound connection to their local environments, with their efforts rooted in a shared commitment to resilience.

In Carabayllo, the association "Union and Force Lomas of Primavera" was established, earning the "Adopt a Soup Kitchen" award and becoming a vital part of the Metropolitan Lima Soup Kitchen Network. Despite the pandemic's challenges, such as movement restrictions, Independencia Lomas achieved remarkable community participation, exemplifying their capacity for adaptation and solidarity during the crisis.

Lomas of Carabayllo Lomas heavily depended on community kitchens supported by the Qali Warma National School Feeding Program and municipal aid. However, while general support was available, targeted assistance for the Lomas regions as ecological spaces was lacking. In contrast, Lomas of Independencia, although a relatively new organization, demonstrated robust community cohesion through collaborations with various social groups to mitigate the crisis, despite minimal external aid. This collaboration underscores the deep trust both associations have built with their partner organizations and the ongoing support they continue to receive.

The pandemic forced both groups to significantly adjust their operational strategies. Lomas of Carabayllo expanded its communal kitchen efforts and embarked on entrepreneurial ventures to enhance local economic resilience. Both groups also recognized the critical importance of communication, utilizing digital platforms to improve coordination, share information, and ensure the smooth execution of their initiatives. This shift not only improved their response to immediate challenges but also laid the groundwork for long-term resilience and sustainable community development.

### 4.3 The outlook beyond COVID-19: anticipating future developments

In the wake of the COVID-19 pandemic, both associations remain hopeful about maintaining their partnerships with supportive entities. Soup kitchens, emblematic of communal endurance, are poised to stay at the forefront of their activities. However, there is concern about the potential for future leaders to underestimate the vital role these associations play.

The commitment to fostering community spirit remains strong within the associations. They are actively exploring recovery strategies from the COVID-19 impacts through diverse initiatives. These include ecological restoration efforts in the Carabayllo Lomas and a mix of educational and economic programs in Independencia, leveraging local resources like the 'Amancaes' flower.

The crisis has underscored the importance of environmental conservation, biosafety measures, and societal solidarity. Both groups acknowledge the necessity of continual education and adaptability to protect community health and manage crises effectively. The general sentiment is one of cautious optimism: the associations trust in the resilience and creativity of their communities, yet they recognize the urgent need for substantial support to recover and flourish post-pandemic.

## 5. DISCUSSION

The neighborhood coalitions in the Lomas areas of Carabayllo and Independencia have demonstrated profound cohesion, rooted in their attachment to the region and dedication to communal welfare. This unity has remained steadfast, even amid COVID-19 pandemic adversities. These groups exhibit strong collective self-regard, supported by a clear understanding of their local environments' inherent value. The vitality of these communities largely owes to their participation in community-driven initiatives, such as soup kitchens and new social organization creation, persisting through the health crisis.

Key features of these groups include enduring partnerships with governmental bodies (such as local municipalities and the Peruvian Lomas Network) and non-governmental organizations, like EBA Lomas. These collaborations are based on mutual trust and dedication. Nevertheless, there is a recognized need for increased support from these entities, particularly in hill regions. This aligns with observations by Munawar et al. [30], noting higher NGO involvement than government and local representatives.

In the area of environmental education and biosafety, local people have expressed a growing demand for more comprehensive and accessible educational programmes and workshops. This finding reflects the thoughts of Lai et al. [31], who emphasise that education and awareness campaigns are essential to prepare communities for impending risks, such as natural disasters or health emergencies. Furthermore, the results underline the importance of education that not only informs but also empowers local communities to act proactively in the face of environmental hazards. Lamond et al. [32] complement this idea by emphasising the need to involve experts on the ground in the design and implementation of these programmes. This ensures that learning is more contextual and effective, which significantly contributes to strengthening community resilience in the face of future challenges.

Zhang et al. [33] emphasize the substantial challenge posed by limited access to professional training and information regarding community involvement and national conservation areas, particularly in developing countries. This issue is particularly pressing, as many communities lack the resources to engage effectively in conservation efforts. Supporting this notion, Lai et al. [31] reveal that 34.15% of rural communities in Taiwan exhibit low exposure to critical conservation issues but possess a high level of awareness. In contrast, 20.57% of these communities experience high exposure but low awareness, indicating a precarious situation that could lead to detrimental consequences if not addressed. Chen et al. [34] further contend that higher education levels are positively correlated with improved response capabilities, underscoring the need for educational initiatives to enhance community engagement.

The COVID-19 pandemic has catalyzed a significant shift in the communication and organizational strategies of these community groups, leading to an increased reliance on digital platforms such as WhatsApp, Facebook, Zoom, and Google Meet for coordination and outreach. Norris et al. [35] highlight that effective communication is essential for articulating community needs, perspectives, and emotional responses. Moreover, Guo et al. [11] argue that the variety of media and communication methods plays a pivotal role during crises, presenting an array of platforms utilized for disseminating information during the Hong Kong typhoons, thereby illustrating how adaptability can enhance community resilience.

These community groups have demonstrated remarkable adaptability during the pandemic by innovating solutions to tackle challenges, such as establishing soup kitchens and leveraging technological advancements to facilitate their operations. This resilience mirrors experiences observed in the Layyah District of Pakistan, where Munawar et al. [30] reported that 36% of the population adopted creative strategies, including the use of tractor tubes to rescue flood victims. Such instances underscore the importance of flexibility and resourcefulness in overcoming adversities, thereby fostering a sense of solidarity and enhancing community capabilities in crisis situations.

## 6. CONCLUSIONS

The study reveals that community organizations in Carabayllo and Independencia possess essential qualities that foster resilience throughout various stages of the COVID-19 pandemic. These qualities include a strong sense of community, active participation from community members, and robust support. These attributes are expected to continue after the pandemic, enhancing both the 'Lomas' ecosystems and the overall community welfare.

However, these regions encounter substantial challenges, such as educational gaps and demographic issues marked by severe poverty. These communities exhibit a propensity for makeshift solutions, creativity, and survival strategies that remain underutilized, possibly due to a lack of external support. The details of recovery plans post-pandemic remain unclear, highlighting the need for more strategic planning.

This assessment identifies the main strengths and weaknesses of these communities during the disaster management cycle, providing a solid foundation for enhancing resilience after COVID-19. This information could serve as a reference for similar groups and assist authorities. Additionally, the results could help improve national programs designed to strengthen social resilience for future crises.

The study also acknowledges some limitations, notably the pandemic's impact on conducting in-person visits to community ecotourism associations. Furthermore, challenges emerged when using virtual platforms for interviews and focus groups, primarily involving members from two specific community associations and representatives from the Peruvian Lomas Network. Future research should include more associations within the network to enable a broader and comparative analysis of the data.

Looking ahead, the outlook for these community groups in overcoming and recovering from the COVID-19 crisis is optimistic. However, they still face hurdles in resource allocation, cultural adaptation, and educational development. As highlighted by Wickes et al. [36], disaster impacts are more severe in socially vulnerable regions. Therefore, key strategies for building equitable community resilience include improving internal coordination, enhancing external communications, creating safe and inclusive environments, and investing in long-term sustainability through leadership and community partnerships, as recommended by Rendon et al. [37].

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