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SUSTAINABLE BUILT ENVIRONMENTS

SUSTAINABILITY IN PERSEVERATION IN BOHEMIAN DISTRICTS:
CASE STUDY IN BARRANCO

CAPSTONE RESEARCH REPORT

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ABSTRACT

This research investigates the challenges of gentrification, displacements, and opportunities linked to reusing historic buildings and how they are adapted in the Barranco district of Lima, Peru. Seeing it as a sustainable option for adaptive reuse for new construction that is immersed in important environmental, social, and economic benefits. Previous research demonstrates that this method not only reduces carbon emissions by 70% but also embodies the principles of the circular economy, promoting sustainability through the preservation of cultural heritage and the revitalization of urban spaces. Therefore, by using methodologies such as perception analysis and case studies, within this is the “Entre Ruinas” initiative. The community's perspectives and opinions on the balance and preservation of national cultural heritage concerning modernization are highlighted. A comparison of sustainable certification systems was carried out and the result was that Sites V2 was the theoretical framework that is best suited to guide these restoration projects in the Barranco district. Next, a strong interest was found on the part of the community, thanks to the key findings, in mainly preserving the cultural heritage, reducing the environmental impact, and promoting tourism in the district. Exploring the possibility that adaptive reuse can be a model that focuses on sustainable urban revitalization, not only improving the cultural identity of the district but also its inclusive bohemian development.

Key words: *Bohemian Districts, Cultural Heritage, Historical Buildings, Sustainability, Perseveration, Revitalize.*

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INTRODUCTION

The Barranco district of Lima, Peru, stands as a compelling example of the intersection between cultural heritage and urban development. Known for its vibrant bohemian atmosphere, Barranco incorporates a lifestyle of the meaning of the movement that celebrates creativity, individuality, and artistic

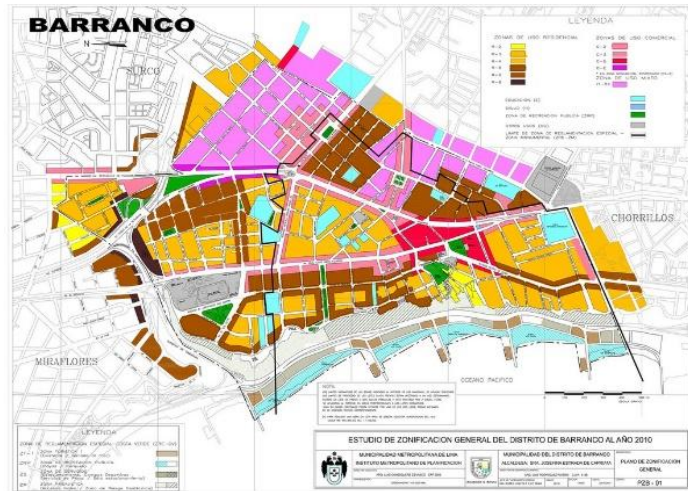


Figure 1 Barranco Map Extract from "(FLICKR):
(<https://www.flickr.com/photos/elmorsa/4563395721/sizes/l/>)"

expression. These qualities have historically attracted artists, musicians, and writers who reject conventional societal norms. Born from a fishing village, Barranco is a highly attractive resort for foreigners and the upper-middle class of the Republic of Lima. Its appeal is based on its large ranches and mansions, which reflect the summer style of the time. As time went by, it gained its own distinctive identity, becoming a utopian district that represented modern Lima culture and became a monumental area. During the War of the Pacific, Barranco was sacked and burned by Chilean troops and later suffered an earthquake that destroyed most of the monumental part of the district. After these events, the reconstruction of the district attempted to replicate the distinctive infrastructure of Barranco plus the current artistic culture of the time, creating a place where tradition and modernity converge. Barranco eventually evolved into a vibrant cultural-artistic center and a gastronomic epicenter, keeping alive the essence of its past while adapting to new artistic and social currents. The characteristic name of the district was born from the beginning of republican history, giving it life due to its location, which is located in the ravine on the coast of Peru. However, as this once-exclusive beach resort has transformed into a bustling hub of artistic activity, it now grapples with the pressing challenge of sustainable preservation. This concept has as its main factor the strategies

employed to maintain and protect cultural and historical resources in a manner that satisfies contemporary demands while safeguarding the interests of future generations. The actual tension between modernization and the preservation of Barranco's unique architectural identity raises critical questions about urban planning, environmental sustainability, and community engagement. As a result, an examination of Barranco's trajectory reveals not only the complexities inherent in sustainable preservation but also the broader implications for cultural identity in an increasingly globalized world.

The adaptive reuse of historic spaces presents a multifaceted challenge, requiring a delicate balance between preserving cultural heritage and ensuring contemporary functionality and user experience. This issue is particularly relevant in the context of urban revitalization, where the transformation of historic structures can catalyze community engagement and economic growth. Historic buildings are tangible manifestations of a community's collective memory and identity, representing significant cultural and architectural heritage. However, many of these structures face threats such as neglect, deterioration, or incompatible uses, jeopardizing their integrity and historical significance.

An example of this challenge is the Barranco district in Lima, Peru. Known for its bohemian vibe and rich architectural heritage, the area is in urgent need of balancing preservation and modernization. The district is home to numerous historic buildings, including Republican era villas and Art Nouveau buildings, which give it a unique character. However, many of the buildings are at risk due to urban development pressures, lack of maintenance, and changing socioeconomic dynamics.

A possible solution is the adaptive reuse of historic buildings that has gained significant attention in recent years as a sustainable approach to urban development and heritage conservation. This practice involves repurposing existing structures for new uses while preserving their historical and architectural significance. *"Adaptive reuse not only significantly reduces carbon emissions—by as much as 70% compared to new construction—but also embodies the principles of the circular economy, promoting sustainability through the preservation of cultural heritage and*

the revitalization of urban spaces." Liliane Wong, Adaptive Reuse: Extending the Lives of Buildings. This approach not only mitigates the environmental impact associated with new construction but also plays a crucial role in preserving local character and fostering a sense of place in urban areas.

Adaptive reuse of historic buildings has gained significant attention in recent years as a sustainable approach to urban development and heritage conservation. This practice involves repurposing existing structures for new uses while preserving their historical and architectural significance.

Adaptive reuse is increasingly recognized as a sustainable alternative to new construction. Djebbour and Biara (2020) argue that repurposing existing buildings can significantly reduce environmental impacts associated with demolition and new construction. This approach not only conserves embodied energy but also minimizes waste generation and resource consumption. In my opinion, this highlights the critical role adaptive reuse can play in addressing climate change and resource depletion concerns.

Despite its benefits, adaptive reuse presents several challenges. Structural issues, compliance with modern building codes, and integration of new technologies are common obstacles faced in such projects. Balancing preservation requirements with contemporary functional needs often requires innovative solutions and careful planning. I believe these challenges underscore the need for interdisciplinary collaboration and creative problem-solving in adaptive reuse projects.

As cities continue to evolve, the importance of adaptive reuse in sustainable urban development is likely to grow. Djebbour and Biara (2020) emphasize the need for continuous assessment and improvement of adaptive reuse strategies to ensure long-term sustainability. Future research should focus on developing innovative technologies and methodologies to address the unique challenges of repurposing historic structures while maintaining their cultural significance. In my opinion, integrating digital technologies and advanced materials science could open up new possibilities for adaptive reuse.

PROBLEM STATEMENT

The situation in Barranco highlights a broader issue facing historic urban areas around the world: How do you preserve the authenticity and cultural significance of historic buildings while adapting them to contemporary needs and standards? This includes addressing challenges such as structural integrity, energy efficiency, accessibility, and integration of modern technologies, while retaining the buildings original architecture and historical value. Additionally, the revitalization of Barranco's historic plaza must consider the social and economic impacts on the local community. It is important to ensure that adaptive reuse projects contribute to sustainable urban development without causing gentrification or displacement of long-term residents.

METHODOLOGY:

The research adopts a qualitative methodology that addresses challenges regarding adaptive reuse in the Barranco district, focusing on preserving national cultural heritage while meeting challenging contemporary expectations. This approach aligns with the overarching issue of preserving the district's culture and history by exploring the cultural, environmental, and social dynamics of revitalization. Key methods include perception analysis, which examines community attitudes, and developers' approach to adaptive reuse through surveys that highlight the benefits of carbon emission reduction and the challenges outlined. Additionally, response analysis delves deeper into qualitative interview responses and open-ended questions to identify themes such as concerns about gentrification and opportunities for economic revitalization. A case study analysis, focusing on the "Entre Ruinas" project, evaluates sustainable certification frameworks to determine the most suitable strategy for the Barranco district. Together, these methods provide a comprehensive understanding of the potential of adaptive reuse to balance preservation with sustainable urban development.

RESEARCH QUESTION

1. How do adaptive reuse projects in historical preservation neighborhoods such as Barranco can prevent gentrification and displacement while contributing to preserving environmental and sustainability benefits?

In this investigation, perception analysis plays a crucial role in understanding how various stakeholders interpret and value this sustainable approach to urban development. By examining the perceptions of community members, architects, developers, and policymakers, researchers can identify the benefits and challenges associated with repurposing historic buildings.. By analyzing these perceptions, investigators can gain insights into the broader societal implications of adaptive reuse, ensuring that future projects align with community values and sustainability goals. Ultimately, perception analysis informs decision-making processes and fosters interdisciplinary collaboration necessary for overcoming the challenges inherent in adaptive reuse initiatives.

This survey is designed to gather data on participants perceptions and preferences regarding the adaptive reuse of historic buildings in the Barranco district of Lima. The survey covers topics such as preferences between restored historic buildings, potential uses for historic buildings, perceived problems and opportunities associated with their reuse, expected economic impacts, the importance of maintaining historic exterior appearances, attitudes towards modern interior modifications, and specific opinions on the future use of a particular historic building. This survey methodology provides a combination of quantitative and qualitative data that can be crucial for analyzing community attitudes toward the preservation and reuse of architectural heritage in Barranco.

The case study analysis in this research mainly focuses on determining and evaluating the “Entre Ruinas” project through sustainable certifications. In this case, the three systems that were investigated were: LEED v4 BD+C, SITES v2, and

WELL Building Standard. The certifications will aim to guide an evaluation in which the key aspects will be the preservation of the national cultural heritage, environmental sustainability, and the effect it will have on the community. The methodologies will be compared and it will be determined which of this best aligns with the objectives of revitalizing historical spaces and preserving the cultural identity of the district. Knowledge from community perception surveys is integrated, where local values, economic opportunities, and sustainability objectives will be highlighted. All this is to guarantee a comprehensive understanding that seeks to ensure that adaptive reuse projects can balance historical preservation with modern functionality.

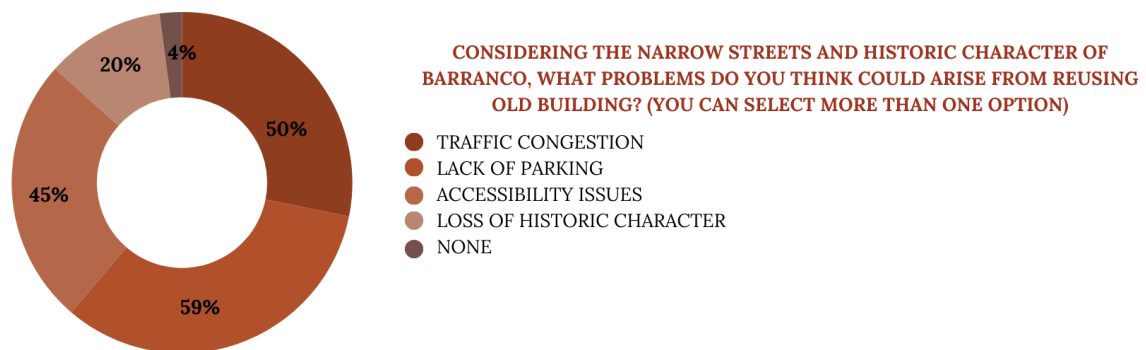
RESULTS AND ANALYSIS
RESULTS PERCEPTION ANALYSIS



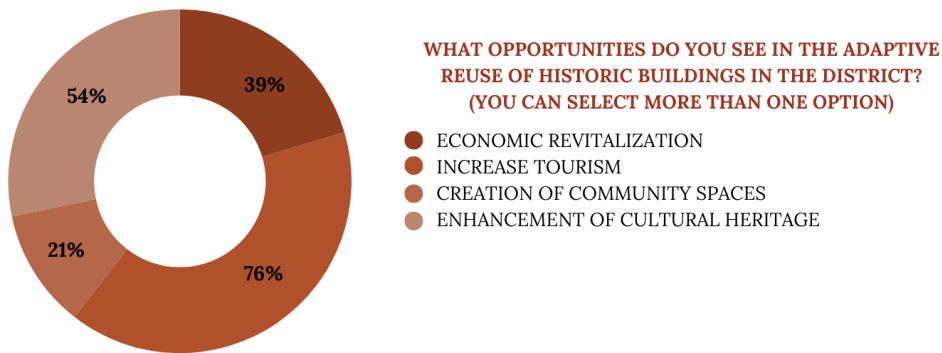
In total there were 80 responses in the survey question “*would you prefer to use spaces in restored historic buildings or in new modern constructions?*”. In the alternative *Restored historic buildings* where 35 responses becoming the second in line. The alternative *new modern constructions* were the one with biggest number with 36 responses. There is a difference with the last alternative *I have no preferences* with 9 responses. The difference lies in user preference. The largest group of people shows a preference for modern buildings, while the smallest group has no current preference because it can be interpreted as having flexible comfort.



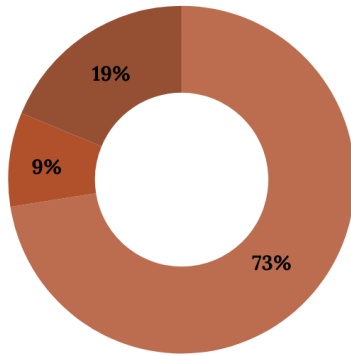
In total there were 161 responses in the survey question “*What types of uses would you like to see in barranco’s historic buildings?*”. In the alternative *cultural spaces* was the one with biggest number with 50 responses. The alternative with least responses was the *community centers* with 5 responses. The alternative *Boutique hotels* with 14 responses, *restaurants or cafes* with 39 responses, *art studios or creatives spaces* with 27 responses, *shops for local artisans* with 12 responses, *educational facilities* with 8 responses and finally *residential units* with 6 responses. As with the first question in the survey, the preference is also due to the user's preference. The highest number of responses are cultural spaces, while the lowest number are community centers. It can be deduced that this is due to the fact that Barranco is a cultural landmark and is highly sought after by tourists. Community centers are mostly requested by residents, while Barranco being a tourist district, a higher percentage of people will want a different alternative.



In total there were 142 responses in the survey question “*Considering the narrow streets and historic character of Barranco, what problems do you think could arise from reusing old buildings?*”. In the alternative *traffic congestion* with 40 responses, the alternative *lack of parking* was the one with biggest number with 47 responses, *accessibility issues* with 36 responses, *loss of historic character* with 16 responses and finally the alternative *none* was the one with least responses 3. After looking at the responses, the lack of parking has the most responses, while the least is the alternative of "none". This shows that the majority of people find faults in the district, while a smaller group of people do not even notice them.



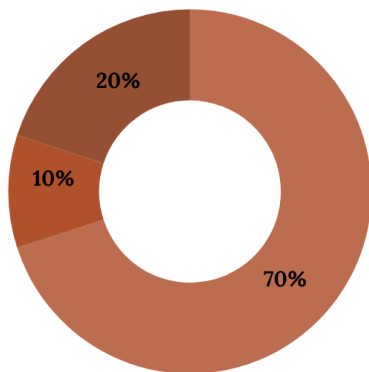
In total there were 152 responses in the survey question “*What opportunities do you see in the adaptive reuse of historic buildings in the district?*”. In the alternative *economic revitalization* with 31 responses, the alternative with more responses were *increase tourism* with 61, The alternative with least responses *creation of community spaces* with 17, and the alternative *enhancement of cultural heritage* with 43. The largest group opts for and ensures the increase of tourism in the district, since it can become a support not only socially but also economically. While the group with the smallest reach was the creation of community spaces, since Barranco is a tourist district, the largest number of people will ensure entertainment.



AS A RESIDENT OR WORKER IN BARRANCO, HOW DO YOU THINK THE REUSE OF HISTORIC BUILDINGS WOULD ECONOMICALLY AFFECT YOU ?

- POSITIVELY (IMPROVEMENTS IN THE AREA, INCREASE IN PROPERTY VALUE)
- NEGATIVELY (INCREASE IN RENTS)
- IT WOULD NOT AFFECT ME

In total there were 80 responses in the survey question “As a resident or worker in Barranco, how do you think the reuse of historic buildings would economically affect you?”. The alternative with most responses is *positively* with 58. The alternative *negatively* was the least respond with 7. Finally, the alternative *it would not affect me* is with 15 responses. The majority of opinions expecting the changes in the district will be highlighted positively because they consider that the use of the spaces will benefit the district. While on the other hand, the smaller sector considers that it will have a negative support only because of the increase in the rent to be paid. We deduce that this difference between negative and positive is part of the development of Barranco, we can conclude that they prefer the development of the district before the economic expense, which is good.

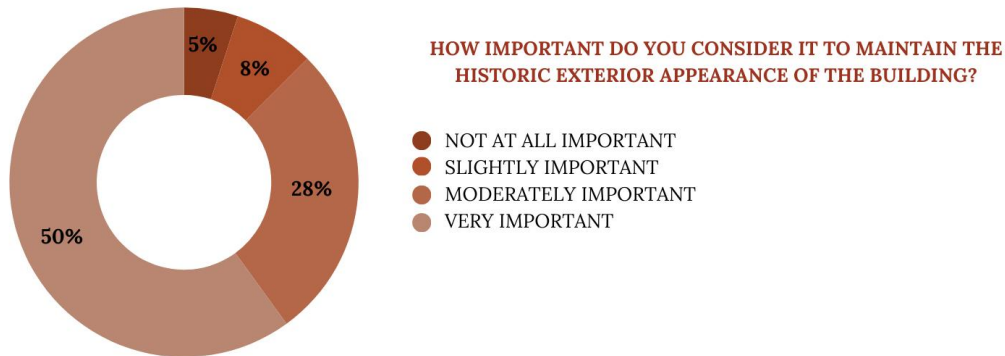


DO YOU THINK RENTS COULD BE AFFECTED? HOW ?

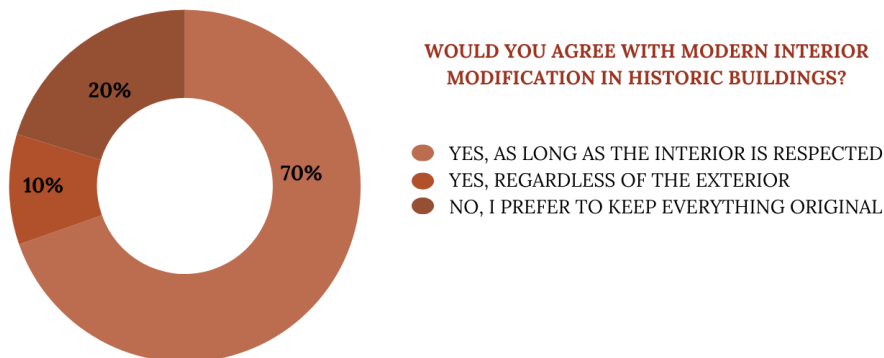
- THEY WOULD INCREASE
- THEY WOULD DECREASE
- THEY WOULD NOT CHANGE

In total there were 80 responses in the survey question “Do you think rents could be affected?”. The alternative with most responses is *increase* with 56. The

alternative *decrease* was the least respond with 7. Finally, the alternative *they would not change is with 15 responses.*



In total there were 80 responses in the survey question “*How important do you consider it to maintain the historic exterior appearance of the buildings?*”. The alternative *not all important* is the one with least responses 4. The alternative *slightly important* with 6 responses. The alternative *moderately important* with 22 responses. Finally, the alternative with most responses is *very important* with 48. It can be seen that people think there will be significant benefits from reusing historic buildings in Barranco, particularly in increasing tourist appeal and encouraging economic growth through job creation. Preservation of cultural heritage reflects the community's desire to maintain the district's identity.

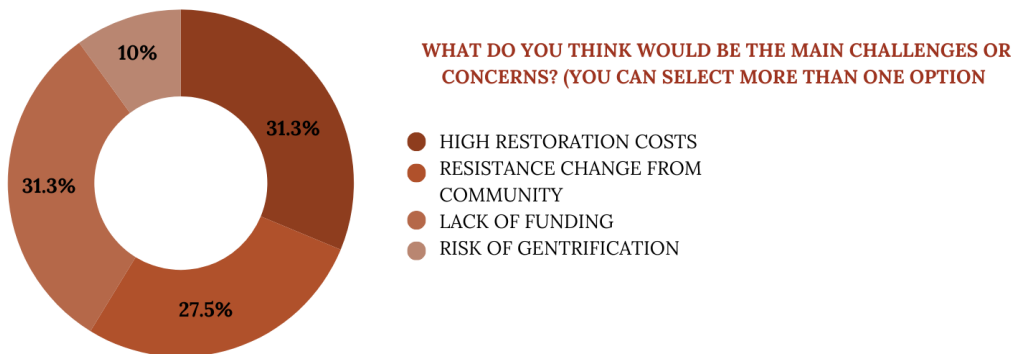


In total there were 80 responses in the survey question “*Would you agree with modern interior modifications in historic buildings?*”. The alternative with most responses is *yes, as long as the interior is respected* with 56. The alternative *yes,*

regardless of the exterior was the least respond with 8. Finally, the alternative *no, I prefer to keep everything original* is with 16 responses.



In total there were 137 responses in the survey question “*What benefits do you think the reuse of historic buildings would bring to the district?*”. The alternative with most responses is *greater tourist appeal* with 56 responses, the alternative *spaces for community events* was the least respond with 15, the alternative *support for local business* with 25 responses, Finally the alternative *preservation of cultural heritage* with 41 responses. They consider that it has greater benefits for the tourist sector than for the community. This reflects the cultural essence of the Barranco district.



In total there were 80 responses in the survey question “*What do you think would be the main challenges or concerns?*”. One of the alternatives with most responses is *High restoration costs* with 25 responses, the alternative *resistance changes from community* with 22 responses. The other alternative with most responses is *lack of funding* with 25 responses. Finally, the alternative *risk of gentrification* was the least

respond with 8. *Concerns about gentrification highlight the need to protect the interests of long-time residents while balancing economic benefits. To overcome these obstacles, comprehensive strategies involving collaboration between government, the private sector, and community organizations would be essential.*



In total there were 80 responses in the survey question “*Looking at the image of this building in Av. Almte. Miguel Grau 694 Barranco, what would you like it to be?*”. The alternative with most responses is *restored to its original purpose* with 25 responses, the alternative *converted into a community center* with 7 responses, the alternative *transformed into a museum* with 16 responses, the alternative *repurposed as a mixed-use space* with 15 responses, the alternative *renovated into a boutique hotel* with 11 responses, *Finally, the alternative other is the least respond with 6*. Many would favor preserving its original purpose, while others favor adaptive reuse options such as transforming it into a museum or boutique hotel to attract tourists and enhance cultural vitality. The interest in converting the building into a community center or mixed-use space reflects a desire to benefit residents and promote social interaction.

CASE STUDY:



Figure 2 Urban Block 6 AV. Almirante Grau



Figure 3 Lot Av Almirante Grau 694

Area	400 m2
Years	+ 100
uninhabited	Since 2002
Altitude	58 m.a.s.l.
Latitude	-12.14470
Longitude	-77.02173



Figure 4 Extract from "(GOOGLE MAPS): (<https://www.google.com>)"

This case study focuses on the Entre Ruinas project, an initiative to build a modern theater in the Barranco district of Lima, Peru. This project seeks to revitalize a historic space, specifically the site of a demolished former Republican mansion, with the goal of creating a new cultural center that respects and honors the rich history of the area.

The purpose of this analysis is to compare three widely recognized sustainable building certifications for existing buildings and projects: LEED v4 for BD+C (Building Design and Construction), SITES v2, and the WELL Building Standard. Each of

these systems offers a unique approach to assessing and improving the sustainability and impact of building projects.

Through this comparison, we seek to determine which of these certification systems best aligns with the specific goals and challenges of the Entre Ruinas project.

By comparing these three certification systems in the context of a single project, we will be able to gain a deeper understanding of how different sustainability approaches can be applied to urban renewal projects in historic areas.

The well Building Standard “COMMUNITY”

"Entre Ruinas"	
Promote community Engagement	The "Entre Ruinas" event invites the public to be part of the creative process, encouraging community participation in the development of the project
Historical Acknowledgment	The project seeks to preserve the memory of the place by incorporating elements of the old mansion into the new design. This demonstrates a respect for the local history and cultural identity of Barranco.

SITES V2

"Entre Ruinas"	
Site context	The project takes advantage of previously urbanized land, avoiding urban expansion. Its location in Barranco, a historic district, promotes the preservation of cultural heritage.

Pre-design assessment + planning	<p>The event "Entre Ruinas " suggests a prior assessment of the site and its history.</p> <p>The participation of the public in the creative process indicates inclusive planning.</p>
Site design – Soil+Vegetation	The incorporation of elements from the old house could include the preservation of existing vegetation.
Site design – material selection	Using materials from the old structure for the new construction could contribute to sustainability.
Site design – human health-well being	The project seeks to create a cultural space that promotes community well-being through the arts.
Operation maintenance	The design of a modern theatre suggests the possibility of incorporating efficient operation and maintenance systems
Education + performance monitoring	The project has the potential to educate the public about the history of the site and the importance of cultural preservation.

LEED V4 BD*+C

"Entre Ruinas"	
Location and Transportation	The project is located in a consolidated urban area, which could help reduce dependence on cars. Furthermore, Barranco is a district with good public transport connections.
Sustainable Sites	The project reuses a previously developed site, avoiding urban expansion. The preservation of elements of the old mansion could contribute to the protection of the habitat.

Material and Resources	Reusing elements from the old house could contribute to reducing waste and using local materials.
Innovation	The integration of historical elements into a modern design could be considered an innovative strategy.

When analyzing and learning more about the three, SITES v2 is the one that takes into consideration the project sought in this research. This makes it especially the best option for adaptive reuse projects similar to “Entre Ruinas”, where the main goal is the preservation and conservation of national cultural heritage accompanied by integration with its urban and historical environment. This is due to the guarantee it offers through means such as the revitalization of historic buildings in the district so that they are not only restored but also endure over time. For Barranco, this certification supports not only the preservation of architectural integrity but also the identity and sense of belonging of the community accompanied by sustainable development.

DISCUSSION

The results highlight a community need to explore adaptive reuse as a sustainable alternative to new construction in Barranco. This approach is exemplified by the proposal to transform a historic building at Av. Almte. Miguel Grau 694 into a modern theater, as part of the "Entre Ruinas" initiative. The research aims to preserve the architectural heritage of Barranco while meeting contemporary cultural needs, showcasing the potential of repurposing existing structures. By focusing on adaptive reuse, Barranco can maintain its unique character and reduce environmental impacts, such as waste generation and resource consumption, associated with new construction. This method also supports economic revitalization by attracting tourism and fostering local businesses, all while preserving the district's cultural identity. The survey indicates that 71% of respondents believe that reusing historic buildings would positively affect them economically, aligning with the goals of sustainability

and urban revitalization. By embracing projects like "Entre Ruinas," Barranco can lead by example in sustainable development, demonstrating how historic preservation and modern functionality can coexist harmoniously.

The comparative analysis of certification systems in the context of the "Entre Ruinas" project shows that SITES v2 is emerging as the most suitable framework to guide and evaluate this reconstruction initiative in Barranco. This is based on several key aspects that distinguish SITES v2 and make it particularly relevant to this unique project.

Firstly, SITES v2 stands out for its comprehensive approach to sustainable land design and development, a crucial aspect for "Entre Ruinas". It more fully addresses the interaction between the new structure and its historical and cultural surroundings. This perspective is fundamental for a project that seeks to integrate a modern theatre into the urban fabric of a district as emblematic as Barranco.

Heritage preservation, a central element of the project. This system explicitly values the protection of historical and cultural elements, aligning perfectly with the goal of honoring the memory of the old Republican mansion. This provides a framework that allows architectural innovation to be balanced with respect for the historical legacy, a key challenge in this project.

CONCLUSION

This research investigates the challenges of gentrification, displacements, and opportunities linked to reusing historic buildings and how they are adapted in the Barranco district of Lima, Peru. This raises the question: How can adaptive reuse projects in historic preservation neighborhoods like Barranco prevent gentrification and displacement while also helping to preserve environmental and sustainability benefits? This method, such as adaptive reuse, offers a result that aims to preserve the district's historic buildings and at the same time meet contemporary demands by minimizing environmental impacts accompanied by the revitalization of urban spaces. This significantly reduces carbon emissions and the consumption of natural

resources. This approach is linked to the principles of a circular economy and contributes to preserving the cultural and historical identity of the bohemian district. On the other hand, the main goal is also to involve the local community to ensure that the required needs and values are reflected, to avoid gentrification and displacement. Not only helps protect Barranco's legacy but also serves as an example to follow for the revitalization of sustainable urban management. Using these inclusive and sustainable strategies, Barranco could maintain its identity and in this way improve the quality of life of residents and be an example to follow in historical preservation and encourage contemporary urban growth.

These findings support Lilita Wong (2016) work that shows that adaptive reuse not only significantly reduces carbon emissions by 70%, instead embodies the principles of the circular economy, promoting sustainability through the preservation of cultural heritage and the revitalization of urban spaces. However, it demonstrates that repurposing existing buildings can significantly reduce the environmental impacts associated with demolition and new construction. This approach not only conserves embodied energy but also minimizes waste generation and resource consumption. Also emphasizes the need for continuous assessment and improvement of adaptive reuse strategies to ensure long-term sustainability, as detailed by Djebbour and Biara (2020). The outcomes of this research demonstrate that adaptive reuse not only helps protect Barranco's legacy but also serves as an example to follow for the revitalization of sustainable urban management. Using these inclusive and sustainable strategies, Barranco will maintain its identity and in this way improve the quality of life of residents and be an example to follow in historical preservation and encourage contemporary urban growth.

LIMITATIONS AND FUTURE RESEARCH

The study's limitations include a relatively small sample size and potential self-selection bias, which may affect the generalizability of the findings. Future research could involve larger sample sizes and more diverse sampling methods to enhance the study's validity. Additionally, in-depth case studies of successful adaptive reuse projects in similar contexts could provide valuable insights and best practices.

By addressing these challenges and implementing the recommended strategies, Barranco can realize its full potential as a vibrant and sustainable cultural destination.

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