




Eco-Innovation and Circular Economy in Medium-Sized Hotels in Tijuana and Ciudad Juárez, Mexico

Ecoinnovación y economía circular en hoteles de tamaño medio de Tijuana y Ciudad Juárez, México

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Abstract

This study analyzes the low level of eco-innovation in medium-sized hotels in Tijuana, Baja California, and Ciudad Juárez, Chihuahua, in Mexico, and its relationship with the adoption of the circular economy strategies. Using a qualitative and phenomenological approach, 14 semi-structured interviews were conducted with hotel managers, and their narratives were examined using inductive coding in ATLAS.ti. Results indicated that although initial practices—such as recycling, efficient resource use, digital technologies, and some clean energy initiatives—are present, their implementation is uneven and constrained by economic, cultural, and knowledge barriers. Human capital, both managerial and operational, emerges as a key determinant for promoting eco-innovation, particularly through training, awareness-building, and the adoption of new technologies. The study explores the connection between human capital, eco-innovation, and the circular economy within a strategic yet understudied sector in northern Mexico, providing valuable evidence for designing public policies and business strategies aimed at sustainability.

Resumen

Este artículo analiza el bajo nivel de ecoinnovación en hoteles medianos de Tijuana, Baja California, y Ciudad Juárez, Chihuahua, en México, y su relación con la adopción de estrategias de economía circular. Con un enfoque cualitativo y fenomenológico, se realizaron 14 entrevistas semiestructuradas a gerentes, cuyos discursos fueron analizados mediante codificación inductiva y ATLAS.ti. Los resultados muestran que, aunque hay prácticas iniciales —como reciclaje, uso eficiente de recursos, tecnologías digitales y algunas energías limpias— su implementación es heterogénea y limitada por barreras económicas, culturales y de conocimiento. El capital humano, tanto gerencial como operativo, aparece como un determinante central para impulsar la ecoinnovación, en especial mediante la capacitación, la concientización y la adopción de nuevas tecnologías. El estudio explora la percepción directiva sobre la conexión entre capital humano, ecoinnovación y economía circular en un sector estratégico y poco estudiado en la frontera norte de México, proporcionando evidencia útil para el diseño de políticas públicas y estrategias empresariales orientadas a la sustentabilidad.

KEYWORDS / PALABRAS CLAVE

Circular economy, sustainability, eco-innovation, hotel managers, environmental management / Economía circular, sostenibilidad, ecoinnovación, gerentes de hotel, gestión ambiental.

JEL Classification / Clasificación JEL: Q50, Q56, R19.

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1. Introduction*

The circular economy proposes modifying the current linear process of production, distribution, and consumption towards a cyclical one of regeneration, reuse, restoration, and the return of materials to the production system to extend their life cycles, transform waste into useful raw materials for other industries, and avoid generating more waste. In short, it offers an alternative for companies seeking to positively impact the environment, economic prosperity, and social benefit.

Eco-innovation is conceived as the practical way to guide companies towards the circular economy. One of its most comprehensive definitions is presented by the Eco-Innovation Observatory (EIO): "The introduction of any new or significantly improved product (good or service), process, organizational change, or marketing solution that reduces the use of natural resources and decreases the release of harmful substances across the entire life cycle (EIO, 2012, p. 8)."

The hotel sector is a pillar of the Mexican economy due to its generation of direct and indirect employment, its contribution to the economy, and its foreign exchange earnings (Torres & Grossman, 2012). These companies play an important role in addressing the problems of pollution and excessive resource use, since their activities contribute to water scarcity, pollution, and the generation of solid waste, consequently leading to ecosystem imbalances.

Eco-innovation is the link that connects companies in the hotel sector with the circular economy. Velázquez and Vargas (2014) and Menezes and Da Cunha (2016) point out that these organizations face economic, technological, governmental, and cultural barriers to the introduction of eco-innovations, as well as a lack of technical knowledge and specialized personnel within their human capital. Consequently, this article establishes as its research problem the low level of eco-innovation among medium-sized hotel companies in Tijuana and Ciudad Juárez (two of the most important cities on Mexico's northern border) in the adoption of circular-economy-aligned strategies. It assumes that the human element is indispensable for adopting the circular economy strategies; therefore, it is proposed that a connection exists between human capital, eco-innovation, and the circular economy, given that each individual contributes knowledge, skills, creativity, experience, and attitudes to exploit opportunities and develop new ideas, which are the foundation of change.

* The work of the two anonymous reviewers is appreciated. The research was carried out at the Laboratorio de Problemas Estructurales de la Economía Mexicana, Universidad Autónoma de Ciudad Juárez.

The research questions are as follows: What circular-economy-aligned strategies are implemented by a sample of medium-sized hotel companies in Tijuana and Ciudad Juárez? What are the key connections between the categories identified in the narratives of managers from a sample of medium-sized hotel companies in Tijuana and Ciudad Juárez? What is the effect of human capital (managers and employees) on eco-innovation for the adoption of strategies aligned with the circular economy?

To answer these questions, we conducted field research based on in-situ, semi-structured interviews with general and operations managers of medium-sized hotels across the cities under study. By foregrounding managerial perceptions, decision heuristics, and implementation experiences rather than compliance checklists, this article contributes novel, sector-specific evidence to the growing literature on the circular economy in services and hospitality.

First, it bridges macro-level circular-economy principles (e.g., waste prevention, resource efficiency, product-service loops) with meso-level organizational routines by documenting how managers interpret these ideas and translate them into concrete practices (e.g., water reuse, energy retrofits, food-waste valorization, circular procurement, and housekeeping protocols). Second, it advances theory by mapping perceived drivers and barriers—regulatory uncertainty, capital constraints, supply-chain coordination failures, capability deficits, and demand-side signals from eco-conscious guests—onto established frameworks such as the resource-based view, institutional theory, and the theory of planned behavior, thereby refining these lenses in a service-intensive, asset-light context. Third, it offers a methodological contribution; working with a purposive, non-probability sample, it enables analytic generalization through a transparent coding scheme and a comparative cross-city matrix that future studies can replicate, extend to probabilistic designs, or test quantitatively.

Finally, the findings carry actionable implications for policy and management at a time when authorities are scaling circular economy initiatives. They specify where targeted incentives, information campaigns, green public procurement, and support for local circular ecosystems can reduce adoption frictions, while outlining capability-building supplier engagement and investment appraisal practices that hotel managers can deploy to accelerate circular economy transitions.

2. Data and Methodology

To achieve the research objectives, the qualitative method was used. This method offers multiple benefits: it is flexible, it stems from the researcher's perspective on a

problem or phenomenon, and it helps understand people within their own reality. It was assumed that managers' positive perceptions and knowledge of economic, social, and environmental problems, as well as the benefits that eco-innovation and the circular economy bring to addressing these problems, contribute to their implementation. Table 1 shows a series of stages that were followed to develop the research (Álvarez-Gayou, 2003) (see Table 1).

Table 1. Research Stages

<p>1. Definition of the problem and research questions</p>	<p>Problem: The low level of eco-innovation among medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez in adopting circular-economy-aligned strategies.</p> <ol style="list-style-type: none"> 1. What types of eco-innovations are present in a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez? 2. What are the strategies aligned with the circular economy implemented in a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez? 3. What are the key connections between the categories identified in the narrative of managers from a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez? 4. What is the effect of human capital (managers and employees) on eco-innovation for the adoption of strategies that align with the circular economy?
<p>2. Definition of objectives</p>	<ol style="list-style-type: none"> 1. Describe the types of eco-innovations present in a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez, according to the categories identified in the narrative provided by the managers of these companies. 2. Describe the strategies aligned with the circular economy implemented in a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez, according to the categories identified in the narrative of the managers of these companies. 3. Identify key connections between categories present in the narrative of the managers of a sample of medium-sized companies in the hotel sector in Tijuana and Ciudad Juárez. 4. Describe the effect of human capital (managers and employees) on eco-innovation for the adoption of strategies that align with the circular economy.

3. Definition of the interpretive paradigm	Phenomenology: Focuses on understanding attitudes, opinions, and perceptions expressed through lived experiences.
4. Participant characteristics	Hotel managers in Tijuana and Ciudad Juárez.
5. Procedure for obtaining information	Semi-structured interviews with a sequence of topics to be discussed.
6. Data analysis	Content analysis, use of the ATLAS.ti program.
7. Preparation of the final report	Preparation of an article reporting on the results for a research journal.

Source: Prepared by the authors.

Regarding the sample, to obtain information from an adequate number of companies in each city, a quota sample was selected, based on the 25 identified medium-sized hotel companies. The proportion of hotels in each city was calculated, yielding a number for each subgroup (seven in Tijuana and seven in Ciudad Juárez). According to Izcara (2007), the researcher determines which individuals are part of the study and when it is feasible to conclude the information-gathering process. When the number of discourses obtained allows for a satisfactory interpretation, explanation, or description of all dimensions of the social phenomenon under analysis (Izcara, 2007, p. 28).

The 14 companies were visited between April and May 2022, when a semi-structured interview was conducted to gather managers' perceptions on topics related to eco-innovation and the circular economy. Medium-sized companies were chosen because they are more likely to implement eco-innovations and strategies aligned with the circular economy.

According to Álvarez-Gayou (2003, p. 109), an interview is a conversation in which the goal is to understand phenomena from the interviewee's perspective and interpret the meaning of their experiences. Based on the stated objectives and the assumption that the manager's role is vital to promoting eco-innovation programs and practices aligned with the circular economy, the analysis dimensions summarized in Table 2 were established and used to develop an interview guide (see Table 2).

Table 2. Qualitative Research Dimensions

OPINION ON THE ECONOMIC, SOCIAL, AND ENVIRONMENTAL PROBLEMS OF THE CITY
Q1. In terms of the economy, what do you consider to be the most significant economic problems facing the city?
Q2. What are the most distinct social problems?
Q3. What are the most distinct environmental problems?
SUGGESTIONS FOR ECONOMIC, SOCIAL, AND ENVIRONMENTAL PROBLEMS
Q4. What other factor could you consider, or suggestions could you make in relation to the economic and social problems you mention?
Q5. What other factor could you consider, or suggestions could you make in relation to environmental problems?
Q6. What responsibility does the hotel sector have in relation to environmental problems?
PARTICIPATION OF THE HOTEL SECTOR
Q7. How does it address social and economic issues?
PARTICIPATION OF THE GOVERNMENT
Q8. What is the government's involvement in solving problems, particularly environmental issues?
HUMAN CAPITAL
Questions were asked to assess managers' perceptions of their employees' human capital, and specific questions were used to assess the managers' own human capital. Both formal and informal education for the benefit of their work activities.
Next, the topic of the Circular Economy Law is introduced with a brief explanation, followed by the following questions:
Q9. Are you aware of the Circular Economy Law?
Q10. What is your opinion of the General Law on Circular Economy passed in Mexico?
CIRCULAR ECONOMY
Q11. In your opinion, do you think that companies in the hotel sector should move towards environmental, social, and economic practices simultaneously soon? Why?
Q12. What changes need to be made in hotel companies to contribute to solving the environmental, social, and economic problems you mention?
ECO-INNOVATION
Q13. What investments do you think should be made so that companies in the hotel sector focus on caring for the environment?
Q14. How would you involve your employees, customers, and suppliers (guests) in caring for the environment? (water conservation, energy conservation, green areas).
Q15. What is your opinion on using new technologies to prevent pollution and conserve water, energy, and the environment?

Source: Prepared by the authors.

Once the manager interviews are conducted, several approaches can be used to analyze the qualitative data. This research followed the approach proposed by Álvarez-Gayou (2003) and used interpretive phenomenology. Following this approach, we examine the problem of low eco-innovation levels in adopting circular economy strategies, as well as the effect of human capital (managers and workers) on these variables.

The analysis is based on the managers' experiences, knowledge, and attitudes as heads of the organization, to identify significant themes or phrases. The data was then compiled as follows: 1) All the information was transcribed as quickly as possible to preserve its freshness, clarity, and the meaning of the interviewee's comments; 2) The text was carefully read several times until it was fully understood, and the important points in the discourse were highlighted; 3) The categories or codes were reviewed to classify and label them; 4) A description was carried out as the data was presented, with the support of ATLAS.ti version 22 software and inductive coding; and 5) A reflective process was conducted to arrive at the essence of the phenomenon, where human capital represents a key and indispensable element for increasing the level of eco-innovation and the adoption of circular economy strategies.

In summary, the results presented in the following section are based on 14 semi-structured, face-to-face interviews, seven from Tijuana and seven from Ciudad Juárez, all from medium-sized companies. The collected data allowed us to understand: 1) The presence or absence of eco-innovations and strategies aligned with the circular economy available to the sample of hotel companies; and 2) An approximation of the relationship between human capital, eco-innovation, and the circular economy. Furthermore, direct contact with managers yielded information on: 1) The profile of the human capital (managers and employees); 2) The types of eco-innovations and strategies that align with the circular economy identified in the narrative of the managers of these companies and 3) The key connections between the categories identified as part of this study and 4) The effect of human capital (of managers and employees) on eco-innovation for the adoption of strategies that align with the circular economy.

3. Results

3.1 Ciudad Juárez Managers

The purpose of this section is to examine managerial perceptions of the challenges that companies in the hotel sector face in orienting their strategies toward sustainable development, and to seek a balance among generating economic benefits, protecting the environment, and fostering social well-being. The manager's role is key to managing both physical and intangible resources in contributing to the path toward a circular economy. Therefore, it is assumed that managers' knowledge of economic, social, and environmental problems, and of the benefits that eco-innovation and the circular economy offer in addressing them, contributes to their implementation.

The economic problems perceived by managers in Ciudad Juárez include a lack of urban planning, roads in poor condition, and inefficient private and public transportation, which create a negative image of the city and harm tourism. They also express concern about the scarcity of local supplies for their operations; the unequal competition in wages and hiring bonuses offered by maquiladoras to attract and retain staff; employee turnover; and the lack of technically trained workers in the hotel sector. The withdrawal of some maquiladoras from the area due to electricity shortages, purchasing power constraints, and security concerns is another challenge.

Social problems include insecurity, theft, drug trafficking, and violence, all of which negatively impact the city's image. These issues, which must be addressed, include the lack of recreational spaces, domestic violence, and childcare for working mothers. They add that the lack of leadership in media communication leads to misinformation, divides Ciudad Juárez society, and hinders the unification of projects for the city's growth.

Environmental problems include the lack of green spaces and city cleanliness, the need for reforestation, and the presence of vehicles and public transportation that emit pollutants, contributing to poor air quality. Industrial, chemical, and toxic waste generated by maquiladora activity creates pollution and residue. They also note that the lack of a culture of water conservation and awareness contributes to water scarcity. They believe that environmental sanctions are merely a revenue-generating measure, and that government technical support, the promotion of environmental

stewardship, and stricter transportation regulations are needed. According to the managers, the involvement of the Ciudad Juárez hotel sector in addressing the problems is summarized below.

On the economic front, Ciudad Juárez hotels have implemented measures to attract and retain talent amid a highly competitive labor market driven by the maquiladora industry. These measures include offering hiring bonuses to compete with assembly plants and using incentives focused on “love for the company” and the ease of the job to reduce turnover. Complementarily, the sector promotes business tourism, positioning the city as a destination for corporate stays and professional events, which provides stability in demand and related economic spillovers.

In the social sphere, participation is expressed through direct assistance actions and initiatives to build social capital. Hotels make donations of blankets to shelters and nursing homes, promote community well-being, and run a basic education program for adults who are behind in their studies. They also promote cultural life by organizing events such as Aventuras de Samalayuca, Chupacabras, and Turibús, as well as their own activities, such as the “Bike Ride” at a local hotel. To strengthen these initiatives, they establish partnerships with companies to raise funds for social events and, through exchange programs, provide rooms for participants in charitable activities, including families with children with terminal cancer, as a form of support. Inside, some properties implement nutrition plans for their staff and promote social awareness by caring for stray animals, aiming to be “good neighbors” in their immediate surroundings.

In environmental matters, the sector develops a comprehensive strategy that combines saving, reuse, monitoring, and certification. Initiatives worth mentioning include cleanup drives in downtown Ciudad Juárez and parks, as well as strategies for saving and recycling supported by equipment monitoring. In water management, pool water is recirculated and reused; water dispensers are installed on each floor; refillable systems are available in bathrooms and showers; and bottled water is produced through reverse osmosis to reduce single-use plastics. In supplies and energy, cornstarch plates and cups, LED bulbs, and chemical-dosing dispensers are used, and substances are reviewed to minimize risks. At the same time, cardboard recycling, product reuse, pollution reduction, and solar panels to heat the pool are promoted, with the goal of moving toward an energy self-sufficient company. In guest relations, point loyalty programs are implemented to encourage water and energy conservation, and waste monitoring is conducted. Finally, the Electronic Collection Fair—with tree exchanges and private certification (Biosphere)—reinforces the

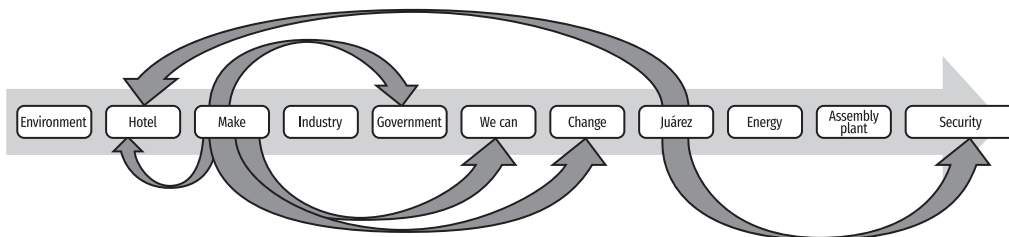
Table 3. Co-Occurrences Between Codes (Ciudad Juárez)

	Environment	Change	Energy	Government	Make	Hotel	Industry	Ciudad Juárez	Assembly plant	We can	Security
Environment	0	2	1	3	4	6	4	2	1	2	1
Change	2	0	0	4	6	0	0	0	1	3	0
Energy	1	0	0	1	0	3	0	1	2	0	2
Government	3	4	1	0	6	3	1	1	1	4	0
Make	4	6	0	6	0	6	3	3	2	6	1
Hotel	6	0	3	3	6	0	1	4	2	4	4
Industry	4	0	0	1	3	1	0	2	3	2	1
Ciudad Juárez	2	0	1	1	3	4	2	0	0	2	4
Assembly plant	1	1	2	1	2	2	3	0	0	2	1
We can	2	3	0	4	6	4	2	2	2	0	1
Security	1	0	2	0	1	4	1	4	1	1	0
Total	26	16	10	24	37	33	17	19	15	26	15

Source: Prepared by the authors based on results from ATLAS.ti 22.

Based on these co-occurrences, a framework was developed outlining the most frequently occurring concepts and key expressions used by managers to interpret their stance toward change or resistance to this circular economy proposal. The framework is presented graphically in Figure 2. It can be summarized as the idea that environmental change is possible. Managers consider involvement from the hotel sector and the government important; the latter must address the security problems affecting tourism in the city (see Figure 2).

Figure 2. Connection Between Codes in the Discourse of Ciudad Juárez Managers



Source: Prepared by the authors based on results from ATLAS.ti 22.

3.2 Tijuana Managers

Regarding Tijuana's hotel managers, they mention that the most prominent economic problems are business closures, low wages, rising product prices, and the unequal distribution of wealth, which creates an imbalance in the population's purchasing power. They also cite the purchase of supplies for the hotel sector, which are priced in dollars, and the increase in gasoline and gas prices, which affects their costs and consequently leads to price increases.

Among the social problems they highlight migration benefits them economically, on the one hand, but on the other, it increases the demand for water and energy and contributes to the wear and tear on hotel rooms. In their opinion, crime, insecurity, overpopulation, and a lack of green spaces and public areas are triggers of social problems.

Environmental problems result from a lack of education, culture, and awareness regarding the maintenance of a clean city. They emphasize water scarcity, the underutilization of waste potential for recycling and energy generation, and the presence of monopolies in the sector. They assert that pollution and noise from vehicle traffic led to poor air quality and driver stress. According to managers, the hotel sector in Tijuana is involved in addressing these problems, as summarized below.

The hotel sector in Tijuana has been integrating sustainability practices across its operations, with actions that combine economic efficiency, social responsibility, and environmental initiatives. In the economic dimension, establishments have promoted active staff collaboration to reduce costs and save energy, thereby reinforcing an internal culture of efficient resource use. This approach is complemented by ongoing staff training in proper equipment handling and correct linen washing, as well as by offering workplace courses and education. These measures increase productivity, standardize processes, and reduce operational losses.

In the social dimension, hotels have established links with specialized associations, highlighting their approach to promoting the inclusion of deaf people in the labor market and donating to an association dedicated to addiction care, as an expression of community co-responsibility. Offering training opportunities within the work environment also serves a dual purpose: strengthening human capital and expanding employees' professional development prospects, while reducing operational losses.

In the environmental dimension, there is a robust set of interventions aimed at responsible resource management and impact mitigation. These include monitoring

Table 4 presents the connections among the main codes in the speeches of Tijuana managers, based on co-occurrence analysis, which identifies those that occur together within a quote or paragraph (see Table 4).

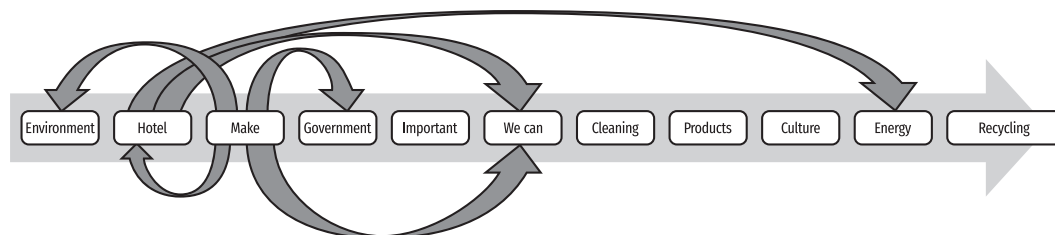
Table 4. Co-Occurrences Between Codes (Tijuana)

	Environment	Culture	Energy	Government	Make	Hotel	Important	Cleaning	We can	Products	Recycling
Environment	0	1	1	4	5	7	3	3	3	3	1
Culture	1	0	1	5	1	0	3	0	2	0	2
Energy	1	1	0	2	2	4	1	1	0	2	0
Government	4	5	2	0	9	3	4	1	5	0	3
Make	5	1	2	9	0	7	3	3	6	0	2
Hotel	7	0	4	3	7	0	2	4	5	2	2
Important	3	3	1	4	3	2	0	0	2	1	2
Cleaning	3	0	1	1	3	4	0	0	2	1	1
We can	3	2	0	5	6	5	2	2	0	0	0
Products	3	0	2	0	0	2	1	1	0	0	1
Recycling	1	2	0	3	2	2	2	1	0	1	0
Total	31	15	14	36	38	36	21	16	25	10	14

Source: Prepared by the authors based on results from ATLAS.ti 22.

Based on these co-occurrences, a scheme is developed using the concepts with the highest frequency in the managers' narrative. In summary, they recognize that it is possible to make changes in favor of the environment, and they consider the participation of the hotel sector and the government, through regulations and incentives, important, mainly in the area of energy. The connection between codes in the discourse can be seen graphically in Figure 4 (see Figure 4).

Figure 4. Connection Between Codes in the Discourse of Tijuana Managers



Source: Prepared by the authors based on results from ATLAS.ti 22.

3.3 Phenomenological Interpretation

The circular economy is seen as a complex model for companies in the hotel sector, as it proposes an economic system in which natural resources, energy, and water are used efficiently; new technologies are introduced to reduce emissions, waste, and pollution; and environmental management is implemented to protect the environment and resources. The circular economy fosters sustainable tourism, where human participation is vital to promoting change in thinking, attitudes, and consumption habits within organizations (senior management and employees), among consumers (guests), among third-party stakeholders (supply chain), and among residents of border cities.

Therefore, it is important to highlight the problems in the cities of Tijuana and Ciudad Juárez in three key areas, which will serve as a basis for promoting public policies that establish guidelines, laws, incentives, awareness programs, and education initiatives to address the needs and advance sustainable development in these towns. As can be seen, the problems perceived by management in its three areas are strongly linked, affecting the sustainable development of the border cities of Tijuana and Ciudad Juárez; consequently, a negative image of these cities is created, to the detriment of tourism and companies in the hotel sector.

M1: "Without a doubt, our streets have deteriorated too much. It greatly affects both our visitors and ourselves." (quote 1:1). "More and more of us are walking around our city" (quote 1:3). "Well, insecurity, without a doubt" (quote 1:435). "...and so it's getting harder and harder for us to go out on our streets, to go out and socialize, and we definitely need more family-friendly spaces." (quote 1:6).

M3: "Maquilas are moving away because of electricity use" (quote 1:43). This affects us greatly here in the hotel sector because maquilas bring us many guests, so both maquilas and we are like an alliance, you could say, since we provide accommodation to many people who come from outside." (quote 1:44).

M4: "Ciudad Juárez continues to be stigmatized as a violent city. There are companies, for example, that we cannot work with, in the case of the hotel... because we are right behind a conflictive area, which for them is a red zone. Sometimes they don't want to stay in the surrounding hotels because there isn't much to do. Still, at the end of the day, they can't stay with me because once they gave us a chance, and a waiter was killed in a nearby establishment, so the next day it was no... I told you it's still a red-light district." (quote 1:506).

M5: "From my perspective in the tourism industry, these campaigns definitely need to clean up the city's image, and that's in terms of safety issues." (quote 1:153).

In this context, introducing the circular economy implies government participation through public policies that promote it in these cities, through regulations, education, training, and incentives, in accordance with the needs of each region and sector of the economy.

M2: "I think it's very good, but greater awareness and dissemination are needed. Training and implementation of laws are required." (quote 1:36).

M6: "Okay, it's our land. If they teach us how to train our workers, there will be a better quality of life. But it needs to be implemented. The authorities say how: regulation and training." (quote 1:408).

M8: "Waste should be valued, 'waste is gold' and can be used to generate energy and control companies that are monopolies in the city." (quote 1:236).

M9: "There should be consequences, and they should be enforced" (quote 1:251).

M11: "Positive opinion, as oil is running out, gasoline and electricity prices have risen. Government assistance is required." (quote 1:311).

M13: "I agree, positive if it is followed up, reaching the goal. It's good, as long as it is followed up and disseminated." (quote 1:368).

Another important aspect to consider is these companies' investment in eco-innovations for environmental protection. While managers acknowledge the benefits of acquiring new technologies, which allow them to reduce costs, they indicate, based on their experience, that a prior economic-environmental cost-benefit analysis is necessary to incentivize such investments.

a. Technological eco-innovations

M1: "Well, they are undoubtedly significant investments in some cases because you have to... replace things. You must replace pumps, systems, etc., etc., in order to actually carry it out. But I've always said... No, for me, I would refer to it as an investment rather than an expense. Because, in the long run, it supports and benefits me as a company in terms of energy savings, which is one of the most significant expenses for any company. And so, in another way, I am continuing with our philosophy of being a socially responsible company." (quote 1:21).

M2: "A monitoring system with sensors that track guests' arrivals and departures, replacing the use of cards and enabling the use of electricity when guests enter their rooms. This reduces electricity consumption. It is a costly investment that brings many benefits in terms of cost reduction and environmental protection." (quote 1:38).

M4: "We are coming for a significant investment in the next few months, and it is regarding the keys... There was an initiative in which, precisely to avoid touching things and spreading viruses, check-in is now done online, and your key is on your cell phone. The investment in this case is in the locks, which have a reader. Normally, you insert your key, it opens and closes, like a credit card." (quotes 1:137 and 1:139).

M5: "We have invested in renewable energy through solar panels, and we are always on the lookout for what causes us the most waste." (quotes 1:169 and 1:170).

M7: "They already have advanced technology in the rooms that cuts off power when no movement is detected." (quote 1:225).

b. Non-technological eco-innovations

M1: "Through the dynamics we have, month after month, of these community wellness activities, we raise awareness of this issue, not only through a document or an image, but by transferring it so that people can see... and experience the needs of the city, which may have a park, where none of us are neighbors, but we

see a need and we commit ourselves to caring for it, cleaning it, and so on. Doing our bit." (quote 1:22)." "We have a sustainability card in the rooms as part of a program, and if the guest leaves the card on the bed, it means they do not want their sheets changed during their stay." (quote 1:23).

M2: "Guests are made aware of the amount of water consumed based on the length of their shower through information provided in each room." (quote 1:40). "Recycling and the separation of organic and inorganic waste are encouraged." (quote 1:39).

M3: "Perhaps doing an activity with them on recycling, on the careful use of chemicals, implementing courses, will help us to better train our staff, so that they become more involved in caring for the environment." (quote 1:78).

M5: "Yes, we do have training on what products to use, which are non-chemical, biodegradable, and environmentally friendly, and we carry out supervision tasks such as turning off lights, processes, and procedures, and we always follow programs such as Green Teams for the hotel industry very closely." (quote 1:189).

M7: "Guests are offered the opportunity to join a loyalty program and the Green Dome program, which encourages customers not to request daily linen changes, thereby earning them redeemable points." (quote 1:223).

M10: "There are stickers inside the rooms that say 'Keep in mind' if you leave the water running, so many liters of water are wasted, to try to raise awareness that they should use the water that is obviously required when they are showering, or when they flush the toilet, or even for cleaning the room." (quote 1:296).

Finally, the managers stated that the shift towards a circular economy must begin with their own education, and that they should then share this knowledge with their employees, as they were not aware of the issue.

M5: "Having knowledge of what currently applies." (quote 1:177).

M6: "It's okay, it's our land, if they teach us how to teach our collaborators, there will be a better quality of life." (quote 1:408).

M11: "Train me first so that I can then teach them." (quote 1:312).

They point out that through formal and informal training and education of their employees (with awareness campaigns, efficient use of resources, recycling and waste separation activities, courses, proper handling of toxic waste, and mass advertising

campaigns) and guests (through informational brochures and posters inside the rooms) it is possible to generate awareness and change habits in favor of the environment.

3.4 Content Analysis

The content analysis identified 602 citations, and the 1165 codes took into account key expressions. To facilitate data interpretation, the codes were organized and classified into ten groups: 1) Human capital of employees; 2) Human capital of managers; 3) Eco-innovation; 4) Circular economy strategies; 5) Perception of the circular economy; 6) Education; 7) Economic problems; 8) Social problems; 9) Environmental problems; and 10) Participation of the hotel sector (social-environmental). The first five groups are of interest as they relate to the objectives of this article. Finally, these codes were classified into 21 categories. The five groups and the categories are shown in Table 5 (see Table 5).

Table 5. Groups/Categories of Human Capital, Eco-Innovation and the Circular Economy

Group 1	Group 2	Group 3	Group 4	Group 5
Human Capital (of Employees)	Human Capital (of Managers)	Eco-Innovation	Strategies Aligned with the Circular Economy	Perception of the Circular Economy
Employee training and education	Present and future actions	Employee training and education	Strategic alliances	Positive perception
Awareness	Anthropocentrism	Environmental certifications	Guest awareness	Negative perception
Environmental concern	Environmental concern	Digitalization	Digitalization	
Recycling and waste separation	Opinion in favor of environmental protection	Eco-innovative products and services	Recycling and waste separation	
Human resources management	Human resources management	Clean energy	Clean energy	
	Circular economy law	New technologies	New technologies	
	Responsibility	Efficient use of resources	Efficient use of resources	
			Framework of the R's	

Source: Prepared by the authors based on results from ATLAS.ti 22.

The managers' opinions highlight relevant points for promoting the circular economy in these companies and serve as a basis for identifying connections among the variables under study. (The citation number generated in ATLAS.ti 22 is attached.)

Group 1. Human capital (of employees)

1. Employee training and education: Ongoing training and education of workers.

M3: "Implementing programs helps us to better train our staff, so that they become more involved in caring for the environment." (quote 1:78).

M9: "Each department chief trains their team, raising awareness among workers." (quote 1:253).

2. Awareness: Raising awareness through activities such as recycling.

M1: "Through the dynamics we have, month after month, of these community wellness activities, we raise awareness of this issue, not only through a document or an image, but by transferring them so that people can see..." (quote 1:22).

3. Environmental concern: Concern about environmental issues across generations of employees is driving changes in their behavior.

M1: "We see it and suffer it every day, there are more and more of us traveling around our city." (quote 1:3).

M4: "Fortunately, the fact that different generations are working together in this case reminds us of the importance of using more cardboard bags for breakfast. We also deal a lot with the fact that people are saying, 'Hey, we're throwing away too much plastic'... What can we do?... These are initiatives that stem from the concern of these different generations that come together to work..." (quote 1:143 and 1:144).

4. Recycling and waste separation.

M7: "As for employees, we implemented a recycling and waste separation program (the proceeds from which are used to make purchases for employees at the end of the year). Supplies such as avocado peel straws." (quote 1:224).

M10: "For example, at the hotel, we try to separate cans and plastics from the rest of the waste, such as paper or boxes, and what do we do? We collect the plastic and aluminum and take it to the recycler, and with that money... we use to buy

them shoes. It's a way to motivate them, because they know that something good comes out of it for them if they do it." (quote 1:295).

5. Human resources management: Human resources are a source of creativity and potential for making a change.

M1: "It can be very difficult for them to adapt to certain things, in terms of procedure, this and that, but they are really very creative. So, I believe that we have a lot of potential to really make a change, I repeat, from our core." (quote 1:390).

Group 2. Human capital (of managers)

6. Actions: These are the actions that companies take to address environmental and social problems: 1) Waste separation and recycling; 2) Monitoring tasks; 3) Cost reduction and environmental impact reduction; 4) Inclusion; 5) Donations.

Future actions: In environmental terms, they express the need to implement a work plan based on previous studies, establish parameters and deadlines for the objectives, the amount to invest, and the economic-environmental return, change procedures, and increase government participation through education, coordination, knowledge, and dissemination.

7. Anthropocentrism: At this point, some managers indicate that there are no serious economic or environmental problems, and their focus is on competing with the maquiladora industry for personnel.

M6: "I don't see any economic problems; there is plenty of work here, but there is staff turnover." (quote 1:197). "There is no pollution. I am from Mexico City, and there are problems there, but here the industry does not cause environmental damage. I always had allergies there, but here it has not affected me. It does not affect me." (quote 1:485).

M11: "There are no economic problems. Compared to Spain, where the economy collapsed, nothing has happened here..." (quote 1:300).

8. Environmental concern: Managers express their concerns about environmental issues.

M1: "There are more and more of us." (quote 1:3).

M4: "We are destroying the planet." (quote 1:144).

M7: "There is no culture of water." (quote 1:437).

M9: "Something is missing." (quote 1:249).

9. Opinion in favor of environmental protection: At this point, the managers agree that environmental stewardship should be a learning experience for everyone and that it is necessary to know what currently applies to this issue, and they state the following.

M4: "We try to be kind to our environment." (quote 1:146).

10. Human Resources Management: They indicate that they carry out activities with their employees to help them recognize the importance of the environment, as well as implementing courses and seeking closer relationships with workers to achieve better results in environmental matters.

M1: "Community well-being...and may the city's needs be met." (quote 1:22).

M13: "Do it from within the company, offer courses and education in the workplace." (1:366).

11. Circular economy law: regulations should be established, and these guidelines should apply to everyone; it is also important to encourage the introduction of clean energy in this sector.

M3: "Above all, there must be more regulation, and guidelines must be established in conjunction with the government to implement an efficient program..." (quote 1:398).

12. Responsibility: They recognize that not everything depends on the government; each individual must drive change in habits, motivate, and educate so that families instill care for the social environment and the natural world.

M1: "I mean, it's not all responsibility to the government, of course, but also down to each of us as responsible citizens..." (quote 1:387).

Group 3. Eco-innovation

13. Employee training and education: Ongoing training is provided on handling chemicals, recycling and waste separation, room cleaning procedures, and the efficient use of water and energy.

M5: "If we have training, what products to use, that are not chemical, that are biodegradable, that are environmentally friendly, and we carry out supervision tasks such as turning off lights, processes, procedures, and they always follow programs such as Green Teams for the hotel industry very closely." (quote 1:189).

M10: "Point one, because when they bring their work supplies, they are all environmentally friendly, they know that, for example, a certain amount of water and product must be used to wash and clean a room, and not because they are trying to save money, but because they are trying to save water. They also turn off the lights; the lights must be turned off, and they must use natural light when cleaning, details like that." (quote 1:294).

M12: "Everyone who joined the company was given training on how to properly wash mops and equipment, how to wash linens properly..." (quote 1:529).

14. Environmental certifications: They state that they comply with environmental regulations, and some have Biosphere certification and sustainability studies from 2020.

M2: "We have Biosphere certification and are conducting sustainability studies in 2020." (quote 1:456).

M7: "We comply with the environmental and psychological standards required of us..." (quote 1:217).

15. Digitalization: Through digitization, they have eliminated paper from many of their procedures, used QR codes for menus, and registered customers via mobile phones.

16. Eco-innovative products and services: Biodegradable supplies, online reservation and payment, energy-saving LED light bulbs, water dispensers on each floor, air dryers, environmentally friendly cleaning products, a water laboratory, and the room key on your cell phone.

M4: "We are coming for a significant investment in the coming months, and it is regarding keys... with this wave of Covid, there was an initiative in which, precisely so as not to touch things and avoid spreading the virus, check-in is now done online, and your key is on your cell phone..." (quote 1:137).

M7: "Supplies such as avocado peel straws." (quote 1:224).

17. Clean energy: There has been little progress on this issue; some hotels use solar energy to heat the pool and reverse osmosis to bottle their own water.

M3: "At least to say, here with us we use solar panels to heat swimming pools, even if it's not a saving that we also have..." (quote 1:60). "If there are certain things that are already being done, such as the use of solar panels, the use of chemicals for the pool is logged in a logbook" (quote 1:87).

M4: "The entire roof of our hotel is covered with solar panels. We've had them for two years now. In terms of energy, we are almost self-sufficient because 70% of the electricity we consume comes from our solar panels..." (quote 1:447).

M5: "In terms of caring for the environment, we are definitely always monitoring what produces the most waste..." (quote 1:186). "...in recent years, we have invested in renewable energy through solar panels..." (quote 1:169).

18. New technologies: Smart floors with light sensors, motion-monitoring systems, and mobile applications for reservations, payments, and customer check-out.

19. Efficient use of resources: They focus on saving detergents, water, and energy; efficient use of washing machines; monitoring equipment through a logbook; and establishing cleaning procedures and processes.

Group 4. Strategies aligned with the circular economy

20. Strategic alliances: With the maquiladora industry, since it is their main client, and at the same time, they jointly carry out actions in favor of the community and the environment.

21. Guest awareness: Through information leaflets, guests are encouraged not to request daily room cleaning or linen changes, thereby reducing water, detergent, and energy consumption.

M1: "We have a sustainability card in the rooms as part of a program, and if the guest leaves the card on the bed, it means that they do not want their linens changed during their stay." (quote 1:23).

M2: "Guests are made aware of the amount of water consumed based on the length of their shower through information provided in each room (informative awareness)." (quote 1:40).

22. Digitalization

M5: "We had the opportunity to take advantage of technology to eliminate everything related to printed paper at check-in." (quote 1:194).

M6: "A QR code is used for the menu." (quote 1:214).

23. Recycling and waste separation: An important point is that they recognize the value of trash and believe that by recycling cardboard, cans, and paper, they obtain resources for the employee of the month event.

M2: "Recycling and separation of organic and inorganic waste are encouraged." (quote 1:29).

M3: "At least here in our hotel, we run recycling programs, we check chemicals, we recycle cardboard, we try to reuse products that can be useful to us, and we try to reduce pollution because it's a very serious problem, not just here in the city, but all over the world." (quote 1:481).

M8: "We should value waste, waste is gold, and take advantage of it to generate energy, control the companies that are a monopoly in the city." (quote 1:236).

24. Clean energy

M7: "Energy savers (LED lights) were introduced." (quote 1:385)

M3: "We use solar panels to heat swimming pools..." (quote 1:60).

25. New technologies: They consider investing in new technologies a way to generate profitability and maintain their image as a socially responsible company.

26. Efficient use of resources: Its main objective is to lower costs through more efficient, renewable energy sources and new technologies. Therefore, its actions are geared towards using less energy, optimizing processes, reducing water consumption, decreasing the use of toxic chemicals, and reducing electricity consumption, pollution, and plastic waste.

M1: "And yes, of course, as a socially responsible company, I reiterate that we are monitoring the teams to ensure they are working efficiently..." (quote 1:19).

27. Framework of the R's: Actions such as recycling waste, recirculating and reusing water and products, and replacing pumps and systems.

Group 5. Perception of the circular economy

28. Positive perception: They recognize that it is a benefit for everyone, that it is good and necessary to implement it to go hand in hand with caring for the environment, and are totally in favor of it being possible.

M1: "So, I am definitely in favor of and supportive of making a change, if we can do it..." (quote 1:389).

M3: "I strongly agree that all these types of processes should be implemented because they help the community more than anything else; they help us feel good about our city. I view it favorably; we just need to look at it and implement it in each company." (quote 1:70).

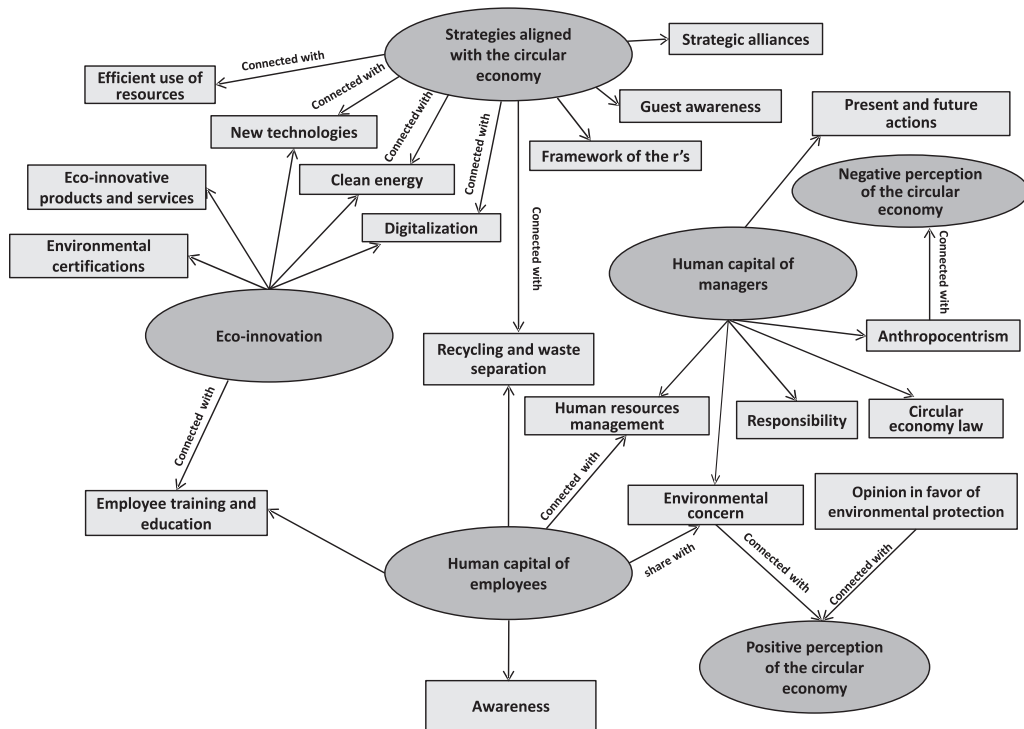
29. Negative perception: They also point out that it is a new concept that will take time to adapt to; the change will not be so fast because we are not prepared, and it cannot be changed overnight.

3.5 Key Connections Between the Identified Categories

According to the content analysis, Figure 5 shows the key connections between the following categories:

- a) Employee human capital and eco-innovation in training and education to optimize the use of energy, water, and resources.
- b) The human capital of managers and employees who share their concern for the environment.
- c) Managers' human capital and a positive perception of the circular economy in the categories of environmental concern and environmental stewardship.
- d) Managers' human capital and a negative perception of the circular economy in the anthropocentric category may influence their ability to adapt to change.
- e) Eco-innovations are identified as strategies aligned with the circular economy, including digitalization, efficient resource use, clean energy, and new technologies (see Figure 5).

Figure 5. Networks Between Human Capital, Eco-Innovation, and the Circular Economy



Source: Prepared by the authors based on results from ATLAS.ti 22.

The circular economy strategies accelerate business transitions, thereby reducing consumption of natural resources and materials, waste generation, and polluting emissions that harm the planet. Among the best-known are those integrated into the Ellen MacArthur Foundation’s Resolve model (Ellen MacArthur Foundation, 2015), which comprises six strategies: 1) Introducing renewable energy and raw materials to enable ecosystem recovery; 2) Implementing the sharing economy to share assets and shift from being consumers to users; 3) Optimizing resource performance and establishing circular supply chains; 4) Closing the loops of materials and products through recycling, recovery, and remanufacturing; 5) Virtualizing products and digital services, and 6) Replacing inputs and technologies with renewable and biodegradable alternatives.

Further, we have the Rs framework, which prioritizes strategies by type. Those with a high level of circularity avoid the extraction of new materials, energy use, and waste generation. Therefore, refusing, rethinking, reusing, repairing, refurbishing, remanufacturing, reworking, recycling, and recovering are actions implemented to varying degrees in companies.

Based on the data analysis, the presence of strategies such as the following was observed: the efficient use of resources (water, energy, supplies) to reduce costs; recycling and waste separation activities; the introduction of solar energy in some areas; green purchasing; strategic alliances and collaborations between suppliers and customers; and community support through donations of linens, park cleanups, and involvement with civil associations, among other actions aligned with the circular economy. These actions are a starting point for companies in the hotel sector, where human capital is indispensable for driving the circular economy. Their participation in these companies is paramount; they represent the company's image to clients and bring creativity and the ability to deliver quality service, grounded in their experience, training, and education. Ultimately, they have the potential to drive the shift towards a circular economy. However, these companies need to increase their organizational eco-innovation, prioritizing the education, training, and certification of their human capital, conducting audits, establishing controls and monitoring systems, and disseminating their environmental policies. These factors reduce the negative environmental impact, promote the efficient use of resources, and foster a shift in mindset toward nature.

Finally, eco-innovation in the hotel sector is key to implementing circular economy strategies. However, the data indicates significant gaps in this area that companies must address. Among the most relevant is the lack of environmental certifications to monitor their progress in environmental protection. Staff training in environmental management is crucial, as well as entering new markets that demand green products and services.

In this context, the circular economy is a distant goal for companies in the hotel sector, as it proposes an economy where natural resources, energy, and water are used efficiently, new technologies are introduced to reduce emissions, waste, and pollution, and sustainable tourism fosters changes in the thinking, attitudes, and consumption habits of people in organizations, tourists, suppliers, and residents of these cities. Achieving this requires government participation through public policies that promote it through regulations, education, training, incentives, and financing, in line with the needs of the hotel sector in Tijuana and Ciudad Juárez.

4. Discussion

The results are consistent with the idea that, in operationally intensive services such as hospitality, the transition to a circular economy often begins with efficiency measures before evolving into process redesigns, circular purchasing, or business model changes. The literature on eco-innovation underlines that these trajectories respond to the double problem of externality (innovation plus environment) and to the combination of regulatory, technological, and market impulses (Rennings, 2000; Horbach et al., 2012).

In the article, circularity appears as a series of partial strategies (digitalization, waste separation, water/energy conservation) rather than a comprehensive transformation. This notion aligns with the criticism that many definitions and applications of the circular economy remain focused on the reduce-restore-recycle triad, omitting its systemic nature (governance, business models, the role of the consumer). Thus, the finding should not be interpreted as a failure, but rather as an early stage of transition, where internal capabilities and external signals have not yet aligned for a regime shift (Kirchherr et al., 2017).

From an applied economics perspective, this early phase is rational; medium-sized hotels tend to select projects with clearer private returns (reduced energy costs, lower water consumption, fewer inputs) and less technological/organizational uncertainty. The findings show that many managers consider cost-benefit-environmental analysis essential before investing in new technologies. The findings are consistent with evidence from international hotel chains, where the adoption of eco-innovations accelerates when managers perceive a competitive advantage or when external instruments are present to reduce risk, such as incentives, standards, or certifications. (Bohdanowicz, 2006; Menezes & Da Cunha, 2016).

Furthermore, according to the literature reviewed, this article makes a contribution by identifying human capital as a causal mechanism for eco-innovation to become a circular strategy (rather than isolated actions). This result aligns with the Natural-Resource-Based View, which understands sustainable competitive advantage as a function of internal capabilities for pollution prevention and sustainable development. In the hotel industry, such capabilities materialize in organizational routines: training, operational standards, monitoring, internal incentives, and environmental leadership (Hart, 1995). The evidence presented regarding the need for training others and for formal and informal education suggests a typical service-sector

bottleneck: circularity demands consistent behaviors from operational staff, middle management, and senior management, beyond investment in physical assets.

Studies of environmental management in the hotel industry show that, even when awareness exists, implementation depends on how green objectives are translated into practices and metrics within the organization (Bohdanowicz & Martinac, 2006).

In this sense, the article aligns with recent literature on green human resource management (Green HRM) and green human capital (GHC). Green recruitment, training, evaluation, and incentive policies strengthen environmental human capital. They also increase the likelihood of green innovation. This effect is mediated by human capital and environmental knowledge, and depends on managerial environmental concern. These factors help explain why managers interviewed show both pro-change and anthropocentric stances. Managerial differences act as an agency constraint on the adoption of green routines (Alrahi et al., 2022; Munawar et al., 2022; Meng et al., 2023).

However, the article identifies economic, cultural, and knowledge barriers, as well as limitations in specialized human capital. This pattern is consistent with international evidence: even in global supply chains, there are more barriers than incentives to eco-innovate, and motivations are driven by competitive advantages and reputation (Barakagira & Paapa, 2024; Holwerda et al., 2024).

In the hotel and tourism sectors, recent reviews indicate that empirical focus has been on water, energy, and waste, while circular procurement and eco-design lag. This operational bias aligns with the reported results: practices are concentrated on internal operations (efficient use, separation, and monitoring) rather than on redesigning offerings, circular contracts with suppliers, or industrial symbiosis (Bux & Amicarelli, 2022; Bittner et al., 2024).

Finally, the border context adds specific frictions. Managers cite insecurity, deficient urban infrastructure, cost pressures, labor competition from maquiladoras, and water and pollution problems. In terms of local economic policy, this matters because hotel circularity depends not only on the hotel itself but also on the urban ecosystem— security, mobility, services, regulation, waste management, and the availability of green suppliers (Pei et al., 2024).

5. Conclusions and Limitations

Eco-innovation in mid-sized hotels in Tijuana and Ciudad Juárez is incipient and heterogeneous, exhibiting a set of initial practices (recycling, waste separation, water/energy efficiency, digitalization, and some clean energy initiatives), but with uneven implementation across establishments. Qualitative evidence shows that the transition toward circular-economy-aligned strategies operates more as a portfolio of isolated actions than as a systemic change in the organizational model and value chain.

Among the most widespread practices are resource efficiency and control (water, energy, detergents, laundry/cleaning processes); waste separation and recovery (cardboard, aluminum, plastics) with internal incentives; digitalization to reduce paper and increase operational control and traceability; and guest awareness mechanisms (in-room messages, sustainability cards, points programs). The adoption of clean energy still appears to be a limited component. Some hotels report installing solar panels, but investment constraints limit their adoption until a cost-benefit analysis is conducted.

The overarching finding is that human capital (managerial and operational) is the central determinant for scaling up eco-innovation and, consequently, accelerating the adoption of a circular economy. Training, awareness, technological appropriation, and organizational culture appear as causal mechanisms in the narratives. A relevant interpretive tension is identified: managerial perceptions favorable to change (environmental awareness and willingness to innovate) coexist with expressions of anthropocentrism/relative denial of the problem, which can block the adoption and deepening of circular strategies.

The study shows that progress toward circularity requires internal capacities, enabling external conditions, effective regulation, incentives, regulatory dissemination, technical support, and coordination between the government and businesses, especially in urban border contexts where insecurity, the city's image, infrastructure, and industrial pressure affect tourism activity. In terms of its contribution, the work provides original evidence by explicitly linking human capital to eco-innovation and the circular economy from a managerial perspective in medium-sized hotels on the northern border, a sector of economic and environmental relevance. Finally, it is concluded that the circular economy is still a distant goal. To approach it, it is necessary to raise the level of organizational eco-innovation through environmental

certifications, audits, monitoring systems, continuous training, and environmental communication, as well as financing schemes and incentives aligned with economic and environmental returns.

Regarding limitations, the phenomenological approach with 14 interviews offers interpretive depth but limits statistical inference and generalization (results may be influenced by social desirability bias, with managers inclined to report more favorable views of their organization). Even so, it is appropriate for identifying mechanisms (human capital, eco-innovation, and circular strategies) and building hypotheses for future studies. Future work could: 1) Measure environmental performance with consumption and waste data, linking it to training and certifications; 2) Model the adoption of green technologies under financial constraints; 3) Evaluate how the perception of urban risk and the regional productive structure influence sustainable tourism and investment decisions and 4) Conducting comparative studies between international hotel chains and independent hotels, which definitively influence the adoption of sustainable practices.



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