

Article

# A Conservation Strategy for the Sanatorio Carlos Duran Cartín in Costa Rica

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**Abstract:** The Sanatorio Carlos Duran Cartín in Costa Rica is a noteworthy example of tuberculosis sanatorium architecture. Positioned within the broader context of Latin American architectural heritage conservation, the research pays specific attention to tuberculosis sanatoriums as a prevalent architectural typology from the early 1900s to the 1940s. Its historical and cultural significance is explored through contextualizing its architectural value and identifying current challenges and conservation needs. Using archival documents and photographic evidence, the study aimed to delineate tangible and intangible values associated with the complex, thus justifying the need for its preservation and safeguarding. Furthermore, the study aimed to establish guidelines and a conceptual framework for a conservation strategy designed for the Sanatorio Duran.

**Keywords:** conservation; significance; Latin American heritage; tuberculosis sanatorium



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## 1. Introduction

This research is framed within the broader context of Latin American architectural heritage conservation, with a specific focus on the tuberculosis sanatorium as an architectural typology prevalent from the early 1900s to the 1940s. The case study under examination is the Sanatorio Carlos Duran Cartín (Sanatorio Duran) in Costa Rica (CR) aiming to understand its cultural significance [1] (art. 1.2).

Latin American history has been profoundly influenced by European culture, resulting in a unique artistic amalgamation with local expressions of Native American communities, shaping a distinct societal model. Despite ongoing European influence, the continent has forged its own path, resulting in its situation and reality being different from the ones in the European continent [2] (p. 186). These distinctions must be considered when researching Latin American Heritage heritage and its preservation. UNESCO establishes that states must adopt policies integrating heritage into community life by establishing protection services, developing scientific methods to counter threats, enacting legal and administrative measures, and supporting training and research initiatives for heritage conservation [3] (art. 5). In these nations, complex social and economic challenges often prioritize addressing social and economic deficiencies over cultural ones, leaving aspects of cultural heritage and historical memory vulnerable. The aforementioned challenges, coupled with inadequate heritage management often entangled in political and bureaucratic processes, contribute to the continual loss of historical memory and impact the management of cultural heritage in Latin American communities.

Tuberculosis (TB) has profoundly impacted human civilization for centuries, prompting extensive research, study, and experimentation to diagnose and treat the disease. These efforts have significantly influenced architectural principles, as architects adapted designs to accommodate evolving notions of healthy living conditions. Throughout the years, there has been a very intimate relationship between architecture, medicine, and health conditions; where the architect has been considered as a doctor and the client or user as the patient [4]

(p. 13), the architectural principles are constantly shaped to fulfill the necessities of what were considered healthy conditions according to the period. The architectural discourse normally weaves itself through a series of theories, which quite frequently surround the aspect of the body and the brain [4] (p. 13). TB, as one of the prominent diseases of the 19th and 20th centuries, dramatically influenced architectural discourse, leading to radical shifts in architectural design principles, particularly evident in the emergence of TB sanatoriums, giving a radical overturn to architecture as a discipline. As Rojas Coll mentioned, it was the emergence of a new architecture, where morphological, programmatic, and formal changes occurred, mostly influenced by the pseudo-medical focus of the architectural projects [5] (p. 8). It was not only after the First World War that the plans of the fight against TB (“Lucha Antituberculosa”) were translated into the massive emergence of TB sanatoriums. TB sanatoriums stand as a significant architectural typology of the modern movement, serving as crucial tools in the global fight against the disease [6] (p. 141).

The sanatorium movement in Latin America began in the early 20th century, heavily influenced by European and North American treatment approaches, reflected in the architectural development of these facilities. Notably, before health authorities took the responsibility of building sanatoriums, the initial intention for sanatorium construction often stemmed from individuals directly or indirectly impacted by the disease, motivated by a desire to establish institutions to aid those afflicted with it, often supported by significant social backing. Despite being just a component of larger medical facilities dedicated to treating tuberculosis, they played a pivotal role in governmental and sanitary efforts worldwide to combat this widespread illness.

The Sanatorio Duran (Scheme 1), founded by Dr. Carlos Duran Cartín, holds a unique position in Costa Rican architectural heritage. Officially recognized by the “Centro de Investigación y Conservación del Patrimonio” (CP) in 2015, the complex faces typical challenges encountered by architectural heritage buildings in CR, including issues related to protection, conservation, and effective management. The absence of a robust legal framework, political will to safeguard heritage, limited economic resources, and broader social issues further complicate preservation efforts, underscoring the importance of addressing these challenges to protect the Sanatorio Duran complex adequately.



**Scheme 1.** Aerial view of the actual conditions of the complex of the Sanatorio Carlos Duran Cartín, with identification of main buildings.

This research aims to comprehensively understand the historical and cultural significance as defined by the Burra Charter [1] of the facilities of Sanatorio Duran. According to

ICOMOS recommendations, heritage site assessment involves a combination of qualitative and quantitative methods. The qualitative approach entails direct observation of structural damage, material decay, and historical and archaeological research, while the quantitative approach utilizes material and structural tests, monitoring, and analysis [7] (art. 2.5). These methods aim to evaluate functional history, contextualize architectural value, and identify conservation needs and current challenges. Through historical research, including an analysis of archival documents and photographic evidence, the study aimed to delineate tangible and intangible values associated with the complex, thus justifying the imperative for its protection and conservation.

Additionally, the research endeavored to formulate guidelines and a schematic framework for a conservation strategy tailored to the Sanatorio Duran, taking into consideration that the renovation of the building, coupled with its re-functionalization, should prioritize preserving the identity and unique characteristics of the site [1,7,8], while carefully considering its relationships within the surrounding context, as is being done for alpine sanatoriums that evolved into specialized hospitals or were repurposed for other compatible architectural programs like tourist accommodation or education and administrative functions [6] (p. 143).

## 2. Materials

### 2.1. Historical Background

The Sanatorio Cartín, founded in 1915 by Dr. Carlos Duran Cartín and the “Junta del Sanatorio Duran” (Sanatorium Board), served as a specialized health center for TB patients. Situated at an altitude of 2080 m above sea level, nestled between the districts of Tierra Blanca and Potrero Cerrado in the province of Cartago, CR, the Sanatorio Duran represented a significant endeavor in the country’s healthcare landscape. Dr. Duran’s commitment to improving healthcare in Costa Rica, fueled by his daughter’s battle with TB, drove the conception and realization of the sanatorium. Taking inspiration from the Loomis Sanatorium in New York, where he sought treatment for his daughter, Dr. Duran dedicated his time to carrying out research, specializing in TB treatment, and studying the necessities TB facilities needed to give adequate treatment to patients. On his return to CR, the knowledge he acquired while studying the facilities of the Loomis Sanatorium and treatments practiced in the establishment informed his vision for a future TB sanatorium in CR. His efforts, spanning the late 19th and early 20th centuries, meant a push for healthcare development in CR. The role and importance medical figures had within the government and their assumption of political roles increased the possibilities for the application of new public policies and the modernization of CR’s government in matters of health and sanitary policies [9] (p. 23).

The Sanatorio Duran, which officially opened in 1918, not only marked a milestone in Central America as the region’s first specialized TB treatment center but also set a precedent for medical infrastructure in the country [10] (p. 283). The design of the Sanatorio Duran drew inspiration from the Eudowood Sanatorium in Maryland, USA, which served as a reference for the physical design and morphology of the sanatorium’s structures. While incorporating international architectural influences, the Sanatorio Duran also adapted to local conditions to address the country’s climatic needs. It can be said the original project of Sanatorio Duran shares a double heritage; while Loomis inspired the programmatic functionality of the Sanatorio, Eudowood influenced its architectural appearance and layout. While the original project was conceived in 1915, the following decades saw the complex undergo several expansions and modifications to accommodate evolving medical needs and advancements.

When comparing the situation of Costa Rican medicine with the rest of Central America, it was known that at the level of TB treatment other institutions such as the Sanatorio Duran did not exist [10] (p. 284). It is noteworthy to emphasize that during the construction of the sanatorium, Spain had only six sanatoriums. This sheds light on the innovative approach taken by the relatively small Central American country in tackling tuberculosis.

Indeed, Costa Rican medicine exhibited a forward-thinking stance compared to neighboring nations, thanks to doctors who had innovative visions that made possible the construction of the Sanatorio Duran and other facilities [10] (p. 285).

According to a booklet [11] issued in 1918 by the Sanatorium Board, the creation of the sanatorium was formalized through Law No. 58 on 16 August 1915. It was designated as a facility to provide shelter, isolation, and treatment for individuals afflicted with tuberculosis. The main reason behind its creation was rooted in the prevalence of the disease in CR, which was identified as one of the main causes of death among the population. Recognizing the urgent need to address this public health crisis, the establishment of an institution like the Sanatorio Duran was considered essential. Not only was it intended to isolate and treat patients effectively, but it also served as an educational center for advancing the understanding and treatment of TB [12] (p. 164). Daily observations focusing on air humidity, temperature, sunlight, precipitation, wind, and velocity were conducted to assess the suitability of the site for the sanatorium. The chosen location offered favorable climate conditions as preferred by experts [13] (p. 466), access to essential resources like water and electricity, good soil quality for drainage, and convenient accessibility due to its isolated yet central position in the mountains.

The architecture of Sanatorio Duran (Scheme 2) not only embodies the evolution of the tuberculosis sanatorium as typology but also showcases the development of architectural styles within the country. A representation of the transition from prevalent historicist architectural styles in the country to the emergence of modern architecture can be observed in the sanatorium. In the early 20th century, Costa Rican architecture continued to be significantly influenced by historicist styles, introduced through imported printed materials and the expertise of professionals educated abroad. These influences were in sync with the country's growing agro-export economy, shaping architectural progress into the early 1900s. Its representative architecture remained strongly rooted in models of historical origin, implementing an architectural language that symbolized, for the liberal elite, the image of progress in Costa Rica. The new constructions of modern influence that were mainly incorporated from 1940 onward took place in a cultural environment where they coexisted simultaneously with other contemporary languages such as the still prevalent Victorian influence, Art Deco, and Hispanic colonial styles. What in Europe required a long period for its formulation and development, arrived in Costa Rica as an accumulation of ideas and principles that had to be assimilated in a short period between the 1930s and 1950s [14] (p. 34).

Although many of the original buildings of the Sanatorio Duran still stand, they have undergone significant changes over the years. The archival sources were crucial in reconstructing the original morphology, details, materiality, and layout of the buildings. The original project, constructed between 1915 and 1918, was designed by engineer Lucas Fernandez, and consisted of three buildings. The central administration building (Schemes 2 and 3) comprised three volumes: a two-level central volume housing administrative offices, doctor's offices, a library, and other ancillary spaces, along with two single-level volumes dedicated to patient observation and recreational areas. The main entrance featured an atrium (which was later demolished) guiding visitors to the main entrance hall, functioning as a circulation hub linking the connecting corridor between the abovementioned volumes and connecting the central volume with the dining hall and kitchen area. The initial buildings closely resembled the Eudowood Sanatorium, yet adjustments to local materials and the tropical climate resulted in the Sanatorio Duran possessing a unique architectural character within the context of early 20th-century architectural styles in the country. The administration building was flanked by two patient pavilions, one for men and one for women. Constructed with local and high-quality materials like cedar and "pochote" wood, the buildings followed a balloon frame construction system and exhibited an austere Victorian-style aesthetic. To mitigate seismic risks, vernacular construction techniques such as "bahareque" (wattle and daub system) and the use of "caña de Castilla" were employed [11] (p. 37). Furthermore, the buildings were elevated from the terrain level

to facilitate ventilation and regulate humidity and temperature, reflecting characteristics of traditional Costa Rican architecture designed to address tropical climate conditions. The patient pavilions (Schemes 2 and 3) at the Sanatorio Duran were designed with a capacity for forty patients each, following a layout and design inspired by various sanatoriums in the United States. Each pavilion comprised a central space and two wings. The central area featured a large room with wide windows and an enclosed space for sanitary blocks, providing a sheltered area. The wings consisted of open-space corridors with slit blinds, allowing for control over light and wind while providing an outdoor ambiance. This design closely resembled the patient wings at the Loomis Sanatorium, which utilized the lean-to-building [15] (p. 119) method pioneered by Dr. Herbert Maxon King, a common approach in early 1900s TB sanatoriums. The construction, design, and management of the Sanatorio Duran were meticulously executed, taking into account contemporary medical advancements and architectural principles. Attention to detail was evident, with climate-adapted spaces and preventive construction practices such as anti-seismic design. These elements underscore the professionalism and dedication that went into the planning and construction of the Sanatorio Duran. Its location demanded self-sufficiency, prompting the construction of supplementary facilities. Expansion plans emerged in the 1920s, including proposals for new pavilions and the incorporation of a church, reflecting the complex's eventual management by the sisters of the order of "Hermanas de la Caridad de Santa Ana". By 1930, evolving architectural practices led to the replacement of the original kitchen building with a more durable concrete structure. The proposal to construct a dedicated pavilion for women and children gained importance, with initial designs drafted by renowned Costa Rican architect Teodorico Quirós; however, financial constraints prevented its immediate realization. The 1930s saw a construction boom in CR, demonstrated by developments at the Sanatorio Duran, which reached its peak in terms of innovation and capacity. During this period, the already drafted design of the Women and Children Pavilion was built alongside amenities such as gyms, recreation areas, and residences for staff and doctors. This era also witnessed enhancements to the original buildings and an increased focus on self-sufficiency within the complex [9] (p. 110). The Women and Children Pavilion (Schemes 2 and 4) deviated from the architectural norms observed in the original buildings by embracing modern design principles. Its architecture incorporated modern concepts in terms of programmatic features, spatial organization, and circulation arrangement. In contrast to the early model of sanatorium typology followed by the original structures, the Women and Children Pavilion adopted a model rooted in modern architectural ideals. The building adopted a monoblock typology, typical of tuberculosis sanatoriums from that era. Spanning two levels, it featured centralized circulation along a central axis. Patient rooms and observation areas were situated on one side to maximize exposure to sunlight, while offices and ancillary spaces occupied the opposite side. Additionally, the pavilion included a roof terrace designed for therapy and recreation. The architectural plan consisted in a series of modules that repeated along the axis granting a linear disposition to the building. The external appearance of the building adhered to the principles of modern architecture, with a volumetric design tailored to the building's function and to the modular layout to accommodate patient bedrooms. Characterized by clean lines and devoid of ornamentation, the structure featured large windows to enhance interior lighting and ventilation. Unlike the conventional flat roofing slab, the building incorporated a four-slope roof to facilitate rainwater drainage necessary in tropical climates.

The Sanatorio Duran was considered a "legitimate pride of the country", known for its ability to adapt and expand its facilities as needed. However, its agenda faced challenges in the 1940s due to factors like World War II and the Civil War in CR, which impacted funding and infrastructure development. By the 1950s, the institution's significance decreased as new healthcare facilities closer to urban centers started gaining importance. Instead of expanding, the sanatorium began demolishing buildings, including the original women's pavilion [9] (p. 60). Despite its proximity to the Irazú volcano, which erupted in 1963 causing damage to nearby towns, the sanatorium itself was largely unaffected. However,

safety concerns arose. Despite multiple historical sources, the exact reasons for its closure in 1973 remain unclear, but mostly could be attributed to the sanatorium complex facing obsolescence. In February 1973, ownership of the Sanatorium property was transferred to the “Dirección General de Adaptación Social del Ministerio de Gobernación, Policía, Justicia y Gracia”. It was repurposed into the “Centro de Adaptación Juvenil Luis Felipe Gonzalez Flores”, a juvenile adaptation center. However, this transformation was met with concern from nearby residents, fearing potential escapes and the impact on the area [9] (p. 64). The center operated until 1990 when it closed. The property was then transferred to the “Ministerio de Agricultura y Ganadería”, which subsequently passed ownership to UPANACIONAL, or “La Unión de Pequeños Productores Agropecuarios Costarricenses”, the current managers and owners.



Administration Building



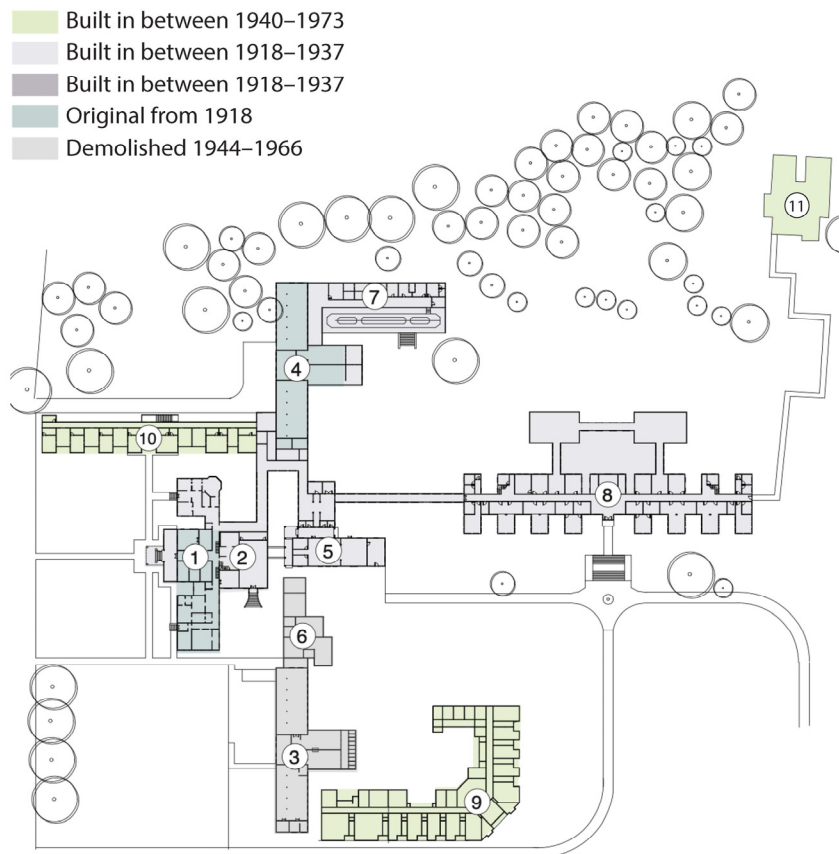
Patient Pavilion



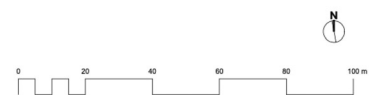
Administration Building



Women and Children Pavilion



- 1. Administration Building
- 2. Church
- 3. Women Pavillion
- 4. Men Pavillion
- 5. Kitchen and Dining Hall
- 6. Laundry
- 7. Men observation wing
- 8. New Women and Children Pavillion
- 9. Women pensioner
- 10. Men pensioner
- 11. Doctor's House

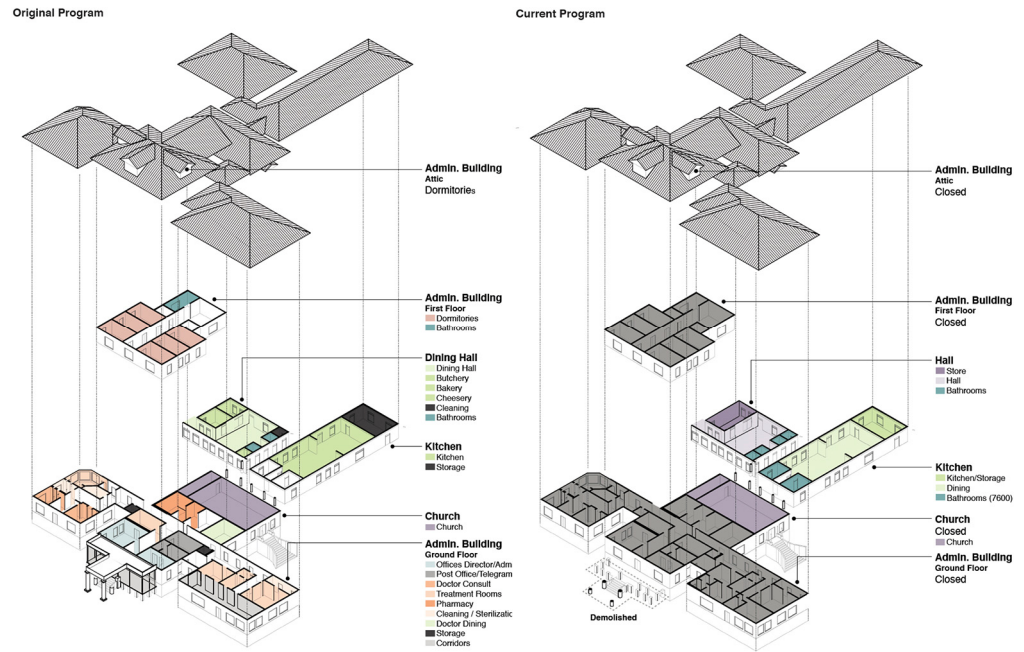


Pensioner Building

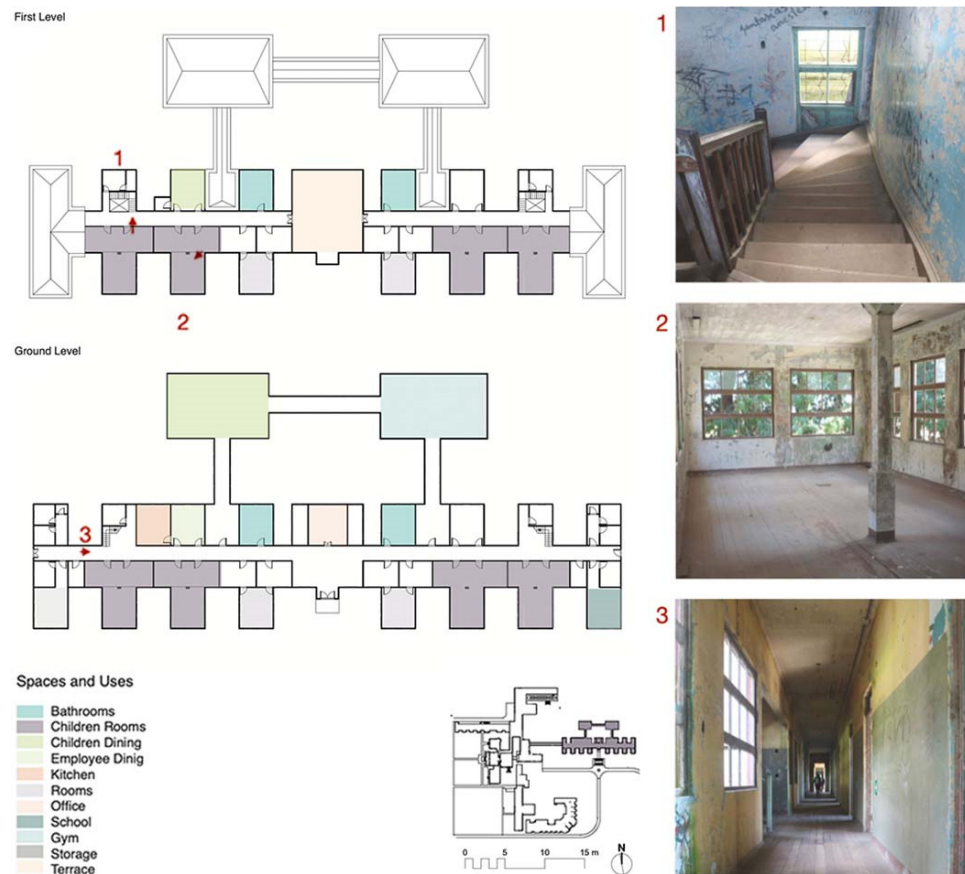


Doctor's Office

**Scheme 2.** Masterplan of the Sanatorio Duran and its evolution across the years of its functioning.



**Scheme 3.** Axonometric diagrams of the original and current programmatic functions of the Administration Building.



**Scheme 4.** Schematic plans of the programmatic functions of the Women and Children Pavilion, and identification of the spaces by current situation photographs.

After its abandonment, the Sanatorio Duran suffered not only physical decay but also a decline in its cultural significance. Regarded as a place associated with illness and death, it became stigmatized and believed to be haunted. Unauthorized visitors engaged in

damaging activities such as satanic rituals and spirit summoning, reinforcing its reputation as a site of paranormal activity. Despite efforts by UPANACIONAL to maintain the property in recent years, focusing on improvements to its surroundings, security measures, and controlling visits, the site continues to attract visitors seeking paranormal experiences rather than appreciating its architectural and historical value.

On 19 November 2014, through an official decree, the architectural complex of the Sanatorio Duran was designated as a cultural heritage site of Costa Rica following a thorough study conducted by architects and historians from the CP. This designation aimed to regulate the preservation of the complex and enhance efforts for its protection and potential restoration projects. Among the reasons [16] cited for its listing were its integral role in the historical evolution of Costa Rican medical history, the establishment of new population centers, and the stimulation of economic activities. Additionally, its uniqueness within both the country and the Central American region signified innovation in tuberculosis treatment. The diverse architectural styles, construction techniques, and materials from different eras show the age of the buildings and reflect the aesthetic values, trends, preferences, and uses of each period.

In 2015, a restoration project for the Sanatorio Duran was presented as part of the “Salvemos Nuestro Patrimonio” contest organized by CP, aiming to preserve architectural heritage in CR. The winning proposal, executed from 2015 to 2017, addressed issues such as water infiltration, incompatible additions, and uncontrolled visits. Its primary goal was to restore the dining hall to encourage further restoration, improve accessibility, and enhance economic sustainability. Despite proposing various interventions such as repurposing the Administration Building and the possibility of adapting the Women and Children Pavilion to host hospitality accommodation spaces, only the restoration of the kitchen and dining hall was carried out. Other parts of the complex remain untouched due to lack of resources, private interest, bureaucratic challenges, and public disinterest.

## 2.2. Current Condition

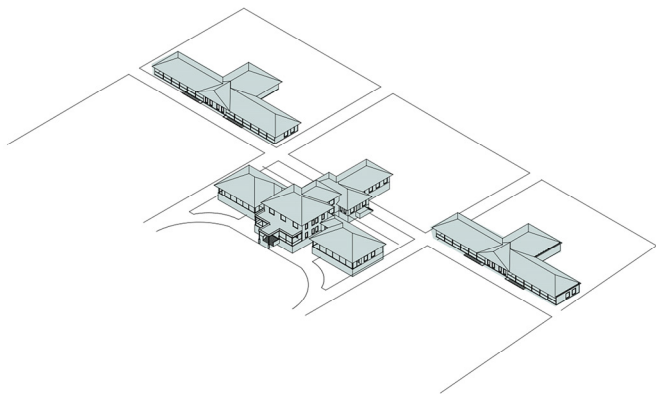
After the restoration project of the Dining Hall and the Kitchen, as was already mentioned, the other buildings of the complex have remained untouched and in a constant process of deterioration. Currently, the complex buildings present different levels of deterioration, accessibility, and integrity [8]. The complex is composed of the following (see Schemes 5 and 6 to understand architectural evolution):

1. The Administration Building, the only survivor from the original 1915 construction, stands in a state of severe decay, inaccessible to the public due to structural instability. It has been closed to preserve its integrity, with its front corridor and atrium demolished at some point in recent years. The exterior paint has faded, revealing multiple layers, while the wood shows signs of extensive wear. Windows are shattered or missing, with some openings covered by steel or aluminum sheets. Poor drainage has led to water leakage inside, damaging interior spaces;
2. Among the buildings erected between 1918 and 1937, the Church, originally serving as a dining area, remains well-preserved and open to visitors. Since undergoing restoration, the kitchen and dining hall are in excellent condition. Similarly, the Women and Children Pavilion stands intact, displaying robust structural integrity and offering public access. Although the gym and recreational areas have been removed, the overall condition of the building is quite good. Some exterior paint may require attention, yet the original white color is still conserved with some signs of humidity. A few window openings have been sealed with concrete, and certain interior spaces are either locked or cluttered with garbage;
3. Lastly, among the structures erected after 1937, the Women Pensioner Building stands in good condition. Closed to the public early on during the complex’s abandonment, it has maintained its integrity. Similarly, the doctor’s house remains intact, although signs of structural wear and deterioration are apparent in both the building’s structure and exterior facade details.



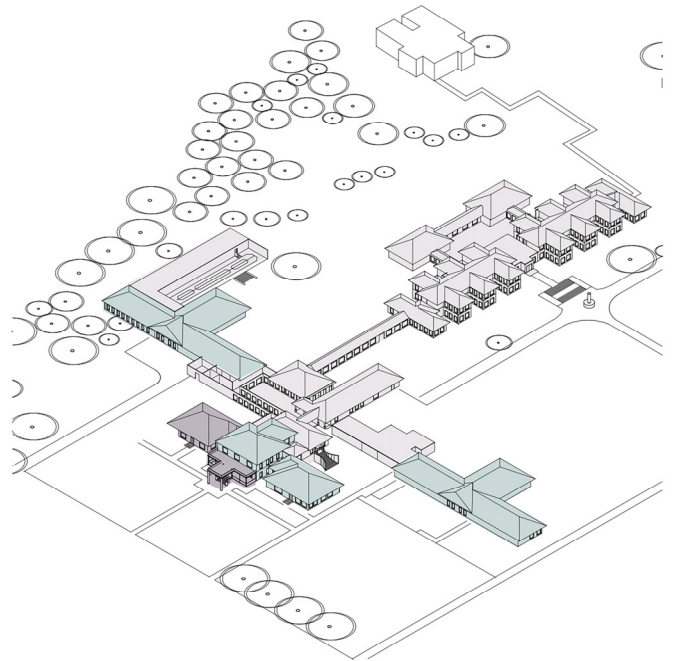
1915–1918 | Construction

■ Built in those years



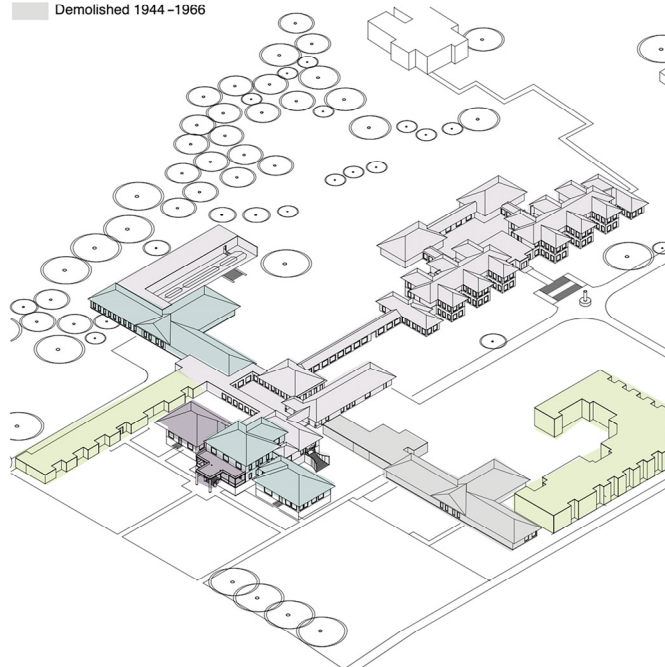
1918–1937 | New Buildings

■ Built in between 1918–1937  
 ■ Refurbished between 1918–1937  
 ■ Original from 1918



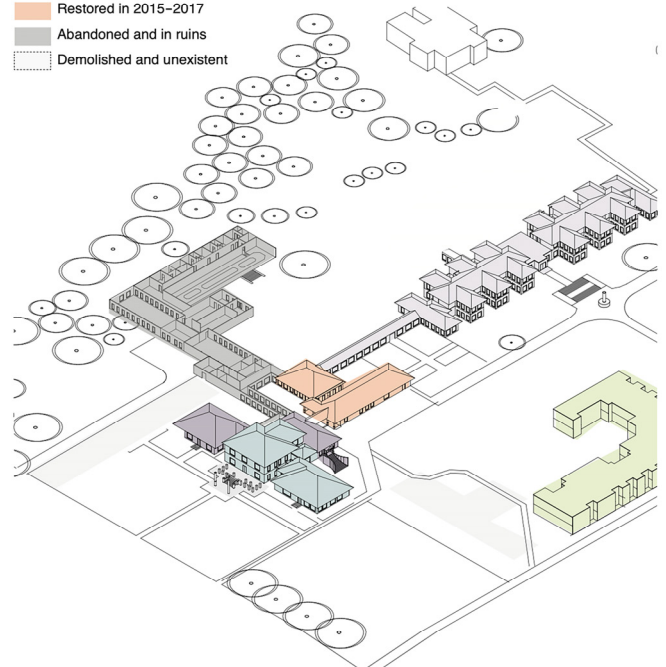
1940–1973 | The Sanatorium and its last decades

■ Built in between 1940–1973  
 ■ Built in between 1918–1937  
 ■ Refurbished between 1918–1937  
 ■ Original from 1918  
 ■ Demolished 1944–1966



2014–2021 | Listing and restoration projects

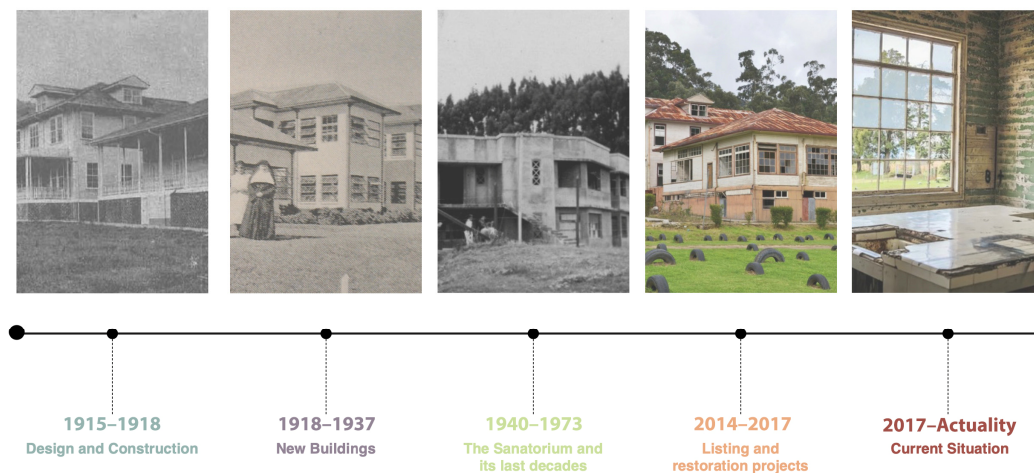
■ Built in between 1940–1973  
 ■ Built in between 1918–1937  
 ■ Refurbished between 1918–1937  
 ■ Original from 1918  
 ■ Restored in 2015–2017  
 ■ Abandoned and in ruins  
 ■ Demolished and unexistent



**Scheme 5.** Axonometric representation of the architectural evolution of the complex of the Sanatorio Duran.

In general, all buildings within the complex, are subject to severe physical decay and they display graffiti on both their exterior and interior walls, evidence of vandalism over the years. Despite significant deterioration and damage, the buildings retain their architectural

quality, original materials, and structural integrity. In recent years, representatives from UPANACIONAL, recognizing the daily visits to the complex and its tourism potential, have taken steps to maintain the landscape. However, further actions are needed to conserve the complex, particularly concerning accessibility and safety. The problematic issues related to physical decay will be explored further in Section 4.2.



**Scheme 6.** Timeline of the evolution of the Sanatorio Duran.

### 3. Methods

The study methodology incorporates historiographic and architectural history research to elucidate the history and heritage significance of the Sanatorio Duran in CR. An extensive information-gathering exercise was undertaken to establish a comprehensive historical background of the sanatorium, assess its current condition, and identify conservation challenges and potential intervention strategies. The recognition of the value of an intervention object is seen as the “physical testimony of its time, place and use of the creative genius of the author and/or its intangible values” [17] (art. 1). By comparing various parameters such as historical, cultural, artistic, and technological aspects, general intervention strategies aimed at preserving and promoting its value can be developed. Additionally, the study sought to contextualize the Sanatorio Duran within the broader architectural typology of TB sanatoriums and the context of 20th-century architectural heritage.

The documentation of the sanatorium movement in Latin America remains behind that of Europe, where the evolution of TB sanatoriums significantly influenced disease treatment and architectural practices. While European scholars have extensively examined this topic, beginning with a focus on the history of medicine, attention eventually shifted toward an architectural perspective. Margaret Campbell’s work serves as a notable example of this transition, as she explores how architecture was influenced by disease in her article “What Tuberculosis Did for Modernism: The Influence of a Curative Environment on Modernist Design and Architecture” [18], where she addresses the accession of modern architecture and the guidelines for spatial configuration and design these brought. Similarly, Beatriz Colomina’s book *X-ray Architecture* establishes a connection between medical innovations and architectural advancements, highlighting how TB treatment requirements shaped architectural design during the modernist movement [4]. However, in Latin America, the study of TB sanatoriums from an architectural history perspective is still quite premature.

Diego Armus, a prominent Argentine historian renowned for his extensive research on disease in Argentina and Latin America, states that medicine has gained significant attention as a research topic in Latin American historiography over the last two decades of the 20th century. He delineates three primary lines of research within it. Firstly, the “new history of medicine” is shaped by the economic, political, and social context in which doctors and institutions operate establishing a dialogue with scientific history. The second line is the one corresponding to the “history of public health” focusing on health

policies and analyzing power dynamics, state intervention, political influences, and the role of the medical profession. Finally, the “sociocultural history of disease” examines the sociodemographic dimensions of specific diseases, the medicalization process, living conditions, healthcare infrastructure, working conditions, mortality effects, and the cultural interpretations and representations of disease within society [19] (p. 12).

In Latin America, TB emerged as a subject of extensive study. The disease acquired considerable attention among Latin American scholars and historians, primarily due to its correlation with processes of urbanization, industrialization, modernization, and modernity [20] (p. 7). Notably, during the 1990s, there was an important emergence in the literature addressing TB, particularly in countries like Brazil and Argentina. This body of literature encompassed diverse theoretical and methodological perspectives, predominantly stemming from the social sciences rather than architectural theory, which demonstrated the profound interest that historians, sociologists, anthropologists, and demographers harbored toward TB. Given the limited historiographic study of TB sanatoriums in Latin America and CR from an architectural standpoint, reliance on sources from social sciences such as history, anthropology, and sociology was necessary for this research. Nonetheless, the study of cultural heritage buildings requires an indispensable combination of scientific expertise and cultural knowledge and experience [21] (p. 946).

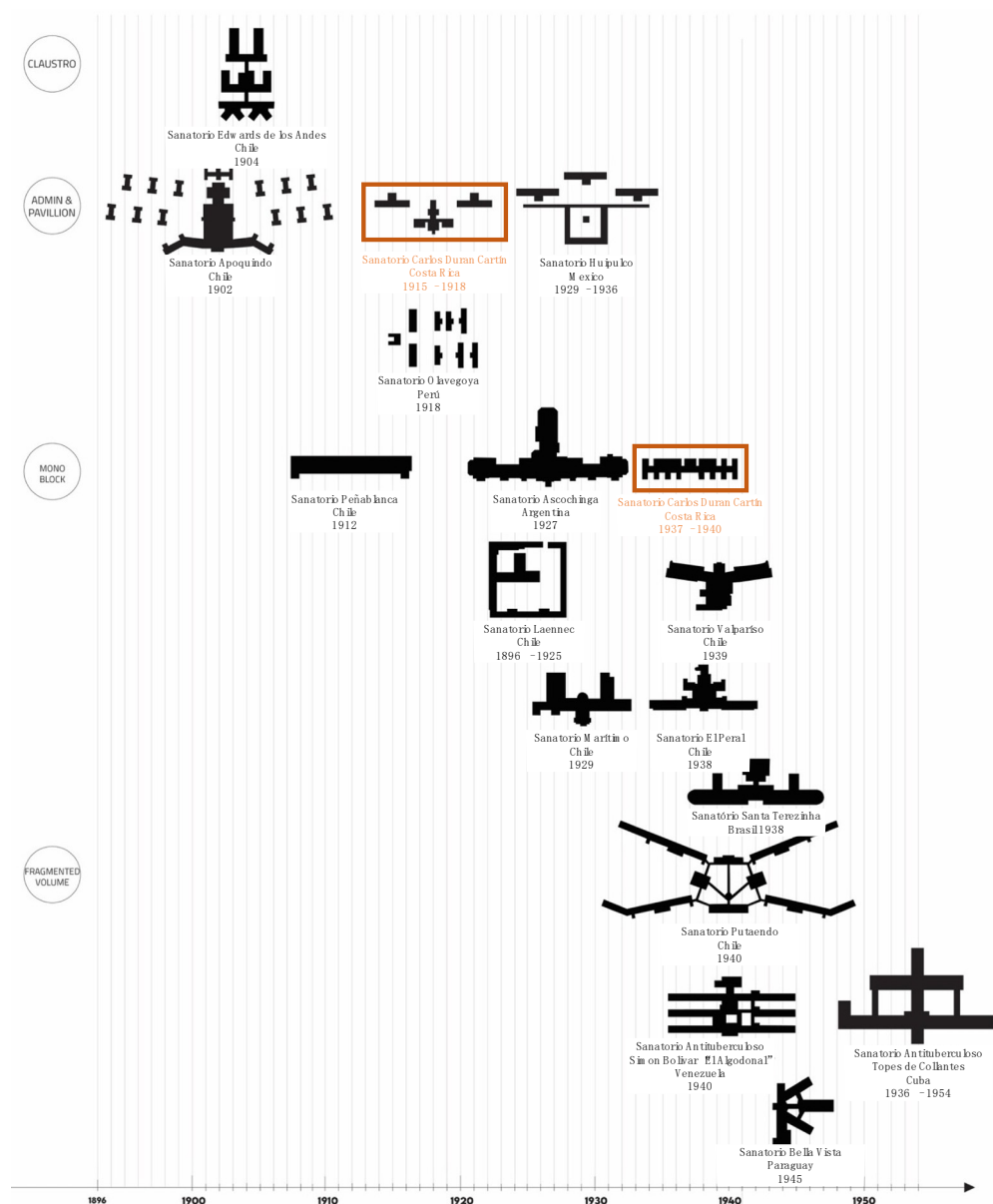
In CR, the exploration of TB as a historical research subject is relatively recent, starting from the early 2000s. This endeavor has predominantly focused on analyzing the Sanatorio Duran, the most important institution established in the country to combat TB. Studies have delved into the institution’s pioneering role in TB treatment, not only within CR but also across Central America. Additionally, considerable attention has been directed towards Dr. Carlos Duran Cartín, the visionary behind the sanatorium, examining his contributions to the development of the public health system in CR. Notable works by scholars like Carmela Velazquez, such as “El Doctor Carlos Durán: Su investigación médica y sus estudios sobre la niñez” [22] and “Tierra Blanca: una montaña de esperanza en la cura de la tuberculosis” [10], have shed light on Dr. Duran Cartín’s medical contributions. Furthermore, anthropologists have drawn upon the experiences of individuals who resided in the Sanatorio Duran to elucidate the institution’s impact in the social aspect [23].

Accessing information solely through virtual means posed a significant limitation due to conducting the research from a location outside of Costa Rica. However, substantial documentation regarding the Sanatorio Duran was acquired through the “Centro de Investigación y Conservación del Patrimonio Cultural”, the organization dedicated to managing cultural heritage in CR. Collaboration from the institution facilitated access to comprehensive information and archival drawings of the sanatorium complex. Additionally, the research predominantly relied on digital formats accessible to the public, emphasizing the acquisition of reliable information from credible sources.

Primary sources, including institutional records and atypical sources such as social media groups, supplemented the research, offering a range of historical materials such as images, postcards, family stories, and archival sketches related to the sanatorium. Notably, the booklet [11] report issued in 1918 by the Sanatorium Board provided crucial insights into the sanatorium’s inception, design, and early management. This document contained a great amount of information, including original architectural designs, complex descriptions, management details, budget breakdowns, and early photos of the Sanatorio Duran’s beginnings. Primary sources played a crucial role in this study; these sources significantly contributed to creating comprehensive historical profiles for the sanatorium.

Accessing scientific articles and studies was crucial for acquiring secondary sources essential to establishing a theoretical framework for studying the Sanatorio Duran, such as the doctoral thesis of Cecilia Ruiloba “Arquitectura terapéutica: el sanatorio antituberculoso pulmonar” where she examined the historical development of hospitals; she stated that as hospitals evolved in their functions, the significance of the term ‘hospital’ also changed, reflecting shifts in the specialization. This transformation is apparent across linguistic, functional, spatial, and formal dimensions, ultimately leading to the emergence of spe-

cialized institutions such as pulmonary tuberculosis sanatoriums [24]. On the other hand, notably, Andrea Rojas Coll’s doctoral research on “Los Sanatorios de Tuberculosis Chilenos” provided significant insights into sanatoriums within the Chilean context, offering valuable contributions to understanding the architectural, health, and hygiene aspects between 1902 and 1940. Coll’s work served as a guiding reference, particularly her typological analysis focusing on three key architectural elements of tuberculosis sanatoriums: rooms, circulation pathways, and resting areas [5]. She conducted an analysis of sanatoriums, categorizing them into general groups such as cloisters, articulated pavilions, monoblocks, and articulated volumes. This framework was then applied to comprehend the architectural morphology of the Sanatorio Duran. Given the similarity in the development of the sanatorium movement across Latin America, addressing the broader Latin American bibliography was essential for contextualizing the study, irrespective of specific national contexts that helped also to contextualize the Sanatorio Duran within the tuberculosis sanatorium typologies in the region (Scheme 7).



**Scheme 7.** Typologies of tuberculosis sanatoriums in the Latin American context, divided by morphological categorization and years of conception. Highlighted: the original buildings of the Sanatorio Duran and the Women and Children Pavilion.

The theoretical framework for this research is centered around the consultation of various sources, particularly focusing on the utilization of charters to guide the conservation strategy, while focusing on concepts like authenticity [8,25], continuity [26] (p. 373), integrity [8] (p. 31), honesty [26] (p. 373), and compatibility [1] (art. 1.11), among others, which are particularly relevant for the conservation process. The charters considered were the Nara Document (1994) for the matter of authenticity of the cultural heritage [25] and mainly the Burra Charter (1999) on the subject of cultural significance, value assessment, and the developing of policies for interventions for a conservation management plan [1]. Given the absence of comparable cases in the Costa Rican context, the charters serve as primary guidelines to support the proposed scenarios for the conservation strategy, with special consideration given to the conservation principles outlined in the Burra Charter. In historic heritage intervention, a building's value is closely linked to its relationship with the site and its historical context. Hence, understanding the architectural complexities of the Sanatorio Duran requires delving into its historical context. Given the relatively recent exploration of sanatoriums from an architectural perspective, it is essential to start by examining the historical background against which the Sanatorio Duran emerged. Existing architectural sources predominantly offer descriptive insights into the Sanatorio's features, functions, and historical evolution. However, there is a noticeable absence of in-depth typological analysis regarding its architectural design. Despite the availability of secondary sources, such as the historical review elaborated by the CP [9], which outlines the evolution of the Sanatorio Duran over time, these materials primarily focus on historical narratives rather than providing a comprehensive architectural typological examination or an assessment of its value. Consequently, this presented as a significant opportunity for further investigation into the architectural complexities of the Sanatorio Duran.

## 4. Results

### 4.1. Evaluation

After the historical research and the description of the architectural elements of the sanatorium, an evaluation was elaborated to define the tangible values like architectural, physical, and landscape values and intangible values like historical and social values of the complex, in addition to the problematic issues affecting it, aiming at defining a statement of significance [27] (p. 1).

#### 4.1.1. Tangible Values

The Sanatorio Duran holds significant architectural aesthetic value [27] (p. 3), showcasing various material choices, architectural styles, and construction methods. Beyond its role in the evolution of Costa Rican healthcare, it serves as a testament to the country's architectural history and as a recorded catalog for architectural professionals and historians [8]. Each architectural style reflects not only the pursuit of optimal healthcare solutions but also the societal, political, and cultural influences of its time. Despite its abandonment, key aspects such as function, form, and materials remain perceivable, preserving its authenticity [8,25] and providing hints about its original design and purpose. The Sanatorio Duran, situated within the Latin American context, serves as a notable case study for understanding tuberculosis sanatorium architecture in the 20th century. Its diverse morphological typologies encapsulate various aspects of this architectural genre, making it a pivotal subject for analysis (Scheme 7).

Moreover, the sanatorium inherently possesses a physical value (Figure 1) in its present condition. The visible deterioration of its materiality is indeed a concern that needs attention in future conservation strategies. However, rather than just viewing this deterioration as a problem, it could be regarded as a potential asset to be enhanced, as it narrates the building's history. The current state of the buildings holds an attraction for visitors; the varied paint shades, differing levels of decay, and the presence of graffiti, whether from vandalism or artistic expression, fill the walls and spaces of the sanatorium with a distinctive character that justifies appreciation and enhancement. Returning the complex to

its original state should not be the primary objective; instead, its worn-out condition and emptiness contribute to preserving the essence of the sanatorium, maintaining a connection to its original meanings while acquiring new ones. It is important to understand that cultural heritage is continuously evolving. It is necessary to view heritage through the lens of both continuity [26] (p. 373) and evolution, while persisting in a process of continual growth and innovative transformation throughout time [28] (p. 3).



**Figure 1.** Physical Value of the Administration Building.

Additionally, the Sanatorio Duran's location adds to its value, situated amongst a dense green natural landscape. UNESCO establishes the importance of linking the protection of cultural and natural heritage due to their relationship with human society [3], so it is not just the architectural value of the Sanatorio Duran but the quality of the natural context in which is placed. The selection of this site was based on climate, altitude, and air quality, factors that were integral to the facility's operations. The context for tuberculosis sanatoriums was crucial because the surrounding natural environment significantly influenced architectural design, due to the reliance on climate conditions as a key factor in tuberculosis treatments. Although the need for high-altitude treatment diminished over time, the area's transition to ecotourism has revitalized its significance.

The surrounding Irazú Volcano National Park and the Prusia forests attract visitors, while the establishment of new town centers, focused on agricultural activities, ensures its continued relevance and potential for the future [29] (p. 8).

#### 4.1.2. Intangible Values

The Sanatorio Duran occupied a singular position within CR's healthcare landscape upon its establishment. Led by Dr. Carlos Duran Cartín, driven by personal experiences with tuberculosis, the institution emerged as a pioneering idea, introducing innovative

treatments and approaches to address the disease in the country. Notably, since its inception in 1918, the Sanatorio Duran quickly rose to prominence, garnering acclaim not only within CR but also across Central America and Latin America as a center of excellence in healthcare provision [30] (p. 3). During this time, there was a significant transformation of healthcare systems, highlighting a collaborative initiative by the government and political entities to enhance the country's medical framework. Furthermore, in addition to its architectural importance, the sanatorium possesses significant historical value [27] (p. 3), functioning as a center for medical research and innovation, and receiving considerable funding from government resources. However, as subsequent advancements in tuberculosis treatment rendered the institution obsolete [31], its purpose was no longer necessary and it eventually faced closure and was later abandoned, marking the end of an era in CR's medical history.

At its inception and throughout its operational years, the Sanatorio Duran held diverse social perceptions. While some viewed it as a place of exclusion from an outsider's perspective, others saw it as a healing sanctuary where many found cures and spent part of their lives. For those who worked there, it was home, and for those who grew up there, it holds childhood memories [23,29]. Professionally, the Sanatorio Duran was seen as a center of innovation and progress in healthcare. Despite these positive views from insiders, outsiders often perceived it as a place of suffering and death. Unfortunately, modern perceptions of the Sanatorio Duran have shifted, overshadowing its original purpose. Today, it is mainly known for supposed paranormal activity, attracting visitors seeking ghostly encounters and sharing their experiences online. Fewer people appreciate its historical and architectural importance. However, this newfound interest and association [1] (art. 1.15) has kept the complex relevant, even though it raises questions about its compatibility with its original purpose and with the architectural integrity. From an architectural point of view, the condition of emptiness has enhanced this new social value [27] (p. 4), referring to the significance the community or groups people visiting the sanatorium have attached to the place over time [27] (p. 8). This new social value emerges from people's perception of the place's history and the presumed situations happening in the establishment. These new associations have transformed how people use the sanatorium; it is no longer a place where people seek to cure tuberculosis but rather a destination for those seeking unearthly experiences. Its use has fundamentally changed the condition of abandonment, offers new ways to experience its spaces, a new way of interpretation of the place. While acknowledging this interest, the challenge lies in preserving its historical significance while accommodating its current reputation. The new significance and usage of the sanatorium's spaces should not be eliminated but embraced, as it keeps the complex vibrant and active. Simultaneously, it is important to educate and inform visitors about the historical importance of the Sanatorio Duran.

Following the assessment of its value, the problematic issues were identified to guide potential conservation strategies. These issues were categorized into tangible and intangible, and design obsolescence.

#### *4.2. Problematic Issues*

##### *4.2.1. Tangible Issues*

The most pressing tangible issue revolves around the abandonment and extensive deterioration of the sanatorium's architectural complex. Despite remnants of original structures dating back to the 1915 original project and subsequent interventions in the 1930s and 1940s, the overall condition of the complex is alarming. Years of neglect following the closure of the Juvenile Center, coupled with inadequate management by the owners and other institutions in charge, have resulted in significant decay. Economic constraints and a lack of prioritization for architectural preservation have exacerbated the situation, with UPANACIONAL focusing primarily on agricultural activities in the surrounding properties, and just landscape maintenance, rather than safeguarding the architectural heritage.

The buildings exhibit varying degrees of decay owing to the diverse architectural styles employed and the construction methods utilized over different periods. The diverse

materiality of the buildings contributes to a unique aesthetic collage, imparting distinct characteristics to the complex [7] (art. 3.14, 3.16). For instance, in the case of the administration building, a chronological sequence of alterations involving additions and demolitions can be observed over time (Scheme 8). These changes have had varying impacts on the structure, with some enhancing its integrity while others have been detrimental, resulting in modifications to the building's physical appearance. As an example, a detrimental addition was the enclosure of the front corridors, originally designated for patient sun exposure. This alteration significantly compromised the building's primary function as a therapeutic space. Another significant change to note is the remodeling and subsequent demolition of the main atrium, leading to the loss of a crucial element of the complex's main building facade.



**Scheme 8.** Additions and demolitions of the Administration Building.

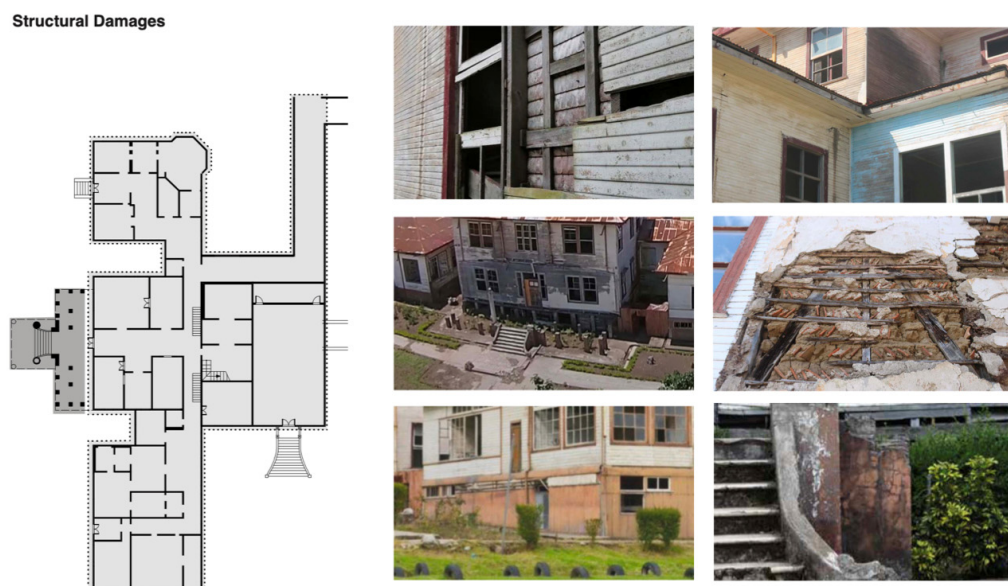
While the current appearance holds potential value, it is crucial to distinguish between degradations that compromise structural integrity and those that could serve as historical artifacts. Surface damage resulting from water infiltration and humidity, leading to mold formation, poses risks to the physical integrity of materials and may contribute to structural collapse if left unaddressed. Examples of this damage can be observed in Scheme 9. For instance, the loss of sections of the external panels of the balloon frame system resulted in the exposure of the internal structure of the walls, as well as the fall of portions of the external stucco of the wattle and daub system present in certain portions of the building. In general, degradation of the building's exterior paint, signs of rust on metal parts, mold growth, and signs of moisture are visible throughout much of the building. Those mentioned above pertain to the exterior part of the building; for the interior spaces, it is believed that the situation is similar, but since the building remains closed it was not possible to obtain information of its current situation.

#### 4.2.2. Intangible Issues

##### Restoration and Possible Loss of Interest in the Place

It is important to consider the possibility of people not being interested in a future restoration of the complex. UPANACIONAL, the current owner, has made an effort to maintain the green areas surrounding the buildings, incorporated safety and cleaning measures, and adapted a parking lot for visitors. The board asserts a lack of funds for restoration, and while CP has a budget for maintenance and potential restoration, the responsibility lies jointly with the owners. The kitchen and dining hall have been restored, generating income to aid in maintenance and recapturing the self-sustaining condition of the Sanatorio Duran. Given the attraction of the ruins, restoration may seem unnecessary. Visitors primarily seek to explore the interiors and the environment of the buildings, suggesting restoration may diminish their appeal. This raises concerns that neither the owners nor the visitors may prioritize restoration, fearing it could diminish the complex's appeal.





**Scheme 9.** Surface and materiality damage to the Administration Building.

### Stigmatization and Collective Perception of the Architectural Complex

Associated with the newfound social value, the Sanatorio Duran is perceived in two contrasting lights. While some are drawn to its historical significance, others are captivated by the notion of paranormal activity. This skewed perception stems from a morbid fascination with the past, leading many to view the sanatorium solely as a place of suffering and death. However, historical research reveals a different narrative, one of resilience and hope amidst adversity [10]. Despite this, the prevailing belief in its haunted reputation persists, fueled by countless accounts of supposed paranormal encounters shared on social media platforms. In response, efforts are underway to reframe the narrative and emphasize the architectural and historical importance of the complex [30]. Professionals from various fields are actively engaged in research and educational initiatives to dispel misconceptions and highlight its true value. While the newfound interest in the paranormal may keep the site relevant, preserving its original significance remains a priority for the legacy of the Sanatorio Duran. The continuous adaptation of humans and the ongoing revitalization of values and stories associated with places and objects in the environment likely play a crucial role in ensuring the enduring sustainability of human societies and their cultural legacy [28] (p. 4).

### Complex Legal Framework

In Costa Rica, the protection of tangible and intangible heritage falls under the responsibility of the CP, a branch of the “Ministerio de Cultura y Juventud”. The legal framework for protecting architectural heritage is outlined in Law 7555 [32], established in 1995. Despite its existence, the process of listing and protecting heritage sites can be complex and time-consuming, often taking several years to finalize. Moreover, challenges arise when dealing with privately owned properties, as not all owners may understand or prioritize the importance of preservation efforts.

The listing process for the Sanatorio Duran, however, was relatively smooth compared to others, as it garnered support from residents, property owners, and municipal authorities who recognized its cultural and historical significance. The listing process involves two main steps: a statement of fact acknowledging the building’s importance, followed by an official declaration of law for its listing. Subsequently, a thorough assessment is conducted based on 14 criteria outlined in Law 7555, including factors such as antiquity, authenticity, and cultural value. A commission comprising representatives from various institutions then reviews the dossier and decides on approval within a specified timeframe. Finally, once the document receives approval, the final listing authorization is granted by the

executive branch of the government, with the official declaration signed by the president of CR.

However, delays in approval are not uncommon, as seen in the Sanatorio Duran's case, where the process took four years despite community recognition and ample evidence supporting its listing. One major concern during the process was the financial burden of maintenance, with the CP expressing reservations about assuming full responsibility, emphasizing the need for collaboration with the property owner [1].

#### Financial Maintenance and Lack of Investment

Before its listing, UPANACIONAL acknowledged its ability to manage security, cleaning, and landscaping but expressed the need for additional revenue streams to sustain the Sanatorio Duran [1]. The refurbishment of the kitchen and dining hall presented such an opportunity. Currently, they offer parking services to visitors for free, but a small entrance fee is charged for access to the complex. UPANACIONAL utilizes the kitchen and dining area to sell its products, generating some income to cover these operational expenses, but it falls short of future restoration efforts.

During the listing process, Ileana Vives, former director of the CP, emphasized that financial maintenance is a shared responsibility between the CP and the owner. While the kitchen and dining hall have provided the Sanatorio Duran with a degree of self-sustainability [15], private investment is necessary for restoration projects. Vives further noted in 2016 that restoration costs are substantial. Although they had explored options for structural reinforcement of the Administration Building, the complete restoration required external investment beyond their means [33].

#### 4.2.3. Design Obsolescence

The Sanatorio Duran faces significant challenges due to design obsolescence, necessitating attention to its electrical, mechanical, and fire protection systems, as well as universal accessibility. Since its abandonment in 1990, deteriorating mechanical water collection systems have led to interior water infiltration, while the absence of a fire protection system poses risks, especially given its proximity to the Irazú volcano. Enhancing accessibility and safety is essential, and repurposing the Administration Building and pavilions offers opportunities for revitalization. Despite its current status as a "living ruin," preserving its current state and essence while improving accessibility and safety remains crucial for its conservation.

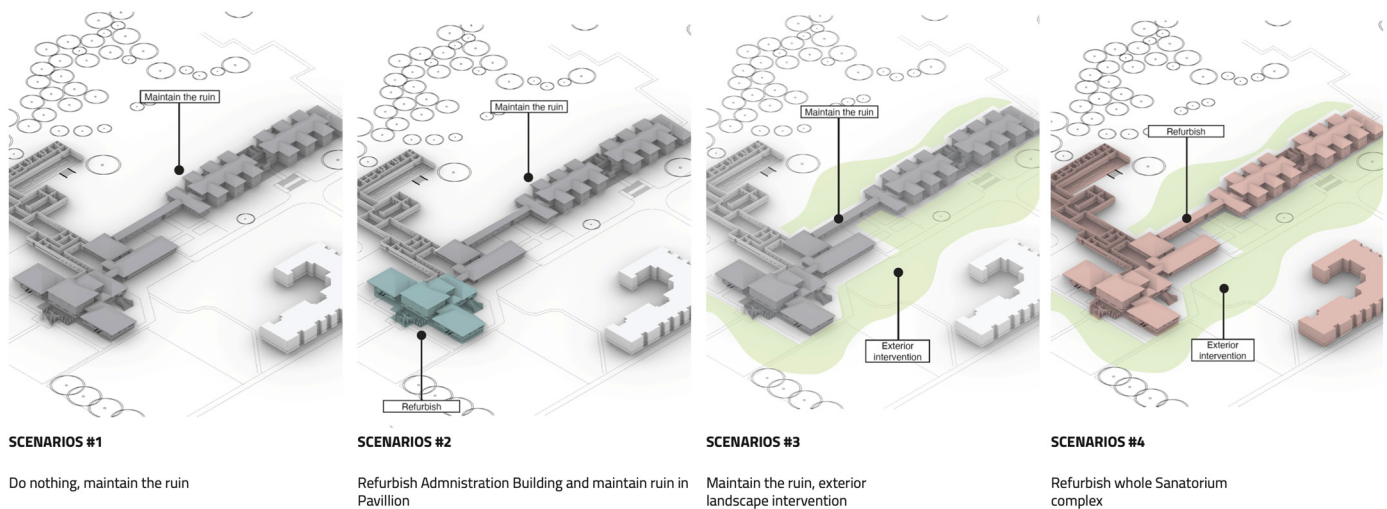
## 5. Discussion

### *Conservation Strategy*

Following the identification of values and problematic issues, several conservation scenarios were devised to provide guidelines for the Sanatorio Duran's preservation. These scenarios (Scheme 10) ranged from no intervention to partial or full restoration, each with its associated outcomes and risks, supported by the abovementioned charters. While the proposed conservation strategy was schematic, it aimed to pave the way for a more comprehensive approach in the future, considering the technical requirements of restoring such a complex. The scenarios focused primarily on the Administration Building and the Women and Children Pavilion, though the surrounding landscape was not overlooked. Ultimately, the goal was to make informed decisions to maintain the integrity of the Sanatorio Duran while ensuring responsible intervention.

Two conservation scenarios were prioritized for the Sanatorio Duran: Scenario 2 focused on restoring the Administration Building while preserving the Women and Children Pavilion as a ruin. After the value assessment, it is considered imperative to intervene in the Administration Building to safeguard its integrity and ensure its continuity in the years to come; instead for the Women and Children Pavilion, since the physical integrity of the building is quite well, it has been decided that maintaining it as a ruin, with preventive preservation measures and security actions, is the most appropriate course of action given

its current condition. The architectural diversity of the Sanatorio Duran requires a range of conservation strategies to address its various levels of deterioration, current uses, and potential. While the proposed strategies serve as a preliminary response to the research and evaluation conducted on the complex, they remain conceptual, providing possible solutions to its physical issues. An important initial step in the conservation process involves a thorough cleaning of the entire complex. While UPANACIONAL undertakes some cleaning efforts in the surrounding green areas, interior spaces suffer from garbage accumulation. Certain areas within the Pavilion are inaccessible due to this accumulation, posing not only architectural integrity risks but also hazards to public health and safety. Given the frequent visits by people of all ages, ensuring a clean and safe environment is important. By addressing this issue, not only will the visitor experience improve, but the architectural spaces will also regain their aesthetic appeal.



**Scheme 10.** Alternative scenarios proposed for the conservation strategy of the Sanatorio Duran.

Scenario 3 involved landscape intervention and the development of a museography strategy for the surrounding green areas of the complex, building upon the actions already initiated by the current owners. The implementation of a strategy for the surrounding landscape, coupled with a museographic itinerary aimed at enhancing the dissemination and educational value of the complex, is considered a complementary measure that can significantly contribute to its overall enhancement. With the previous mentioned, this is expected to promote the diffusion of the history and the importance of the complex.

Following the cleaning process, conservation efforts must focus on preserving the architectural complex's integrity by addressing ongoing deterioration. Preservation actions could be taken, understanding preservation as the actions intended to maintain the fabric of a place in its existent state and retarding deterioration in the sense of "extending the life expectancy of the heritage, maintaining the integrity and minimizing future deterioration" [34] (p. 16), which will be applied to the Women and Children Pavilion (Figure 2) by keeping it as it is, without changing it, retaining its shape, status, and ownership [34] (p. 15). In the proposed intervention scenario, the building will remain "untouched," retaining its current state of emptiness without introducing a new functional use or undergoing significant refurbishment. The intervention will focus on securing the building and ensuring visitor safety by inspecting and verifying the condition of the electrical systems, structures, and other elements. The goal is to preserve the pavilion's essence, maintaining its current state as much as possible. Introducing a new functional purpose for the building is not deemed optimal due to the necessity of aligning it with its spatial configuration; for instance, hospitality use has been contemplated in the past years. However, given the building's obsolescence, embracing a new function would entail extensive refurbishment and system updates, consequently diminishing its newfound significance.



**Figure 2.** Women and Children Pavilion.

Restoration efforts will focus on the Administration Building, understanding restoration as actions that intend to “return fabric of a place to a known earlier state by removing accretions or by reassembling existent components even by using new materials” [34] (p. 16), aiming to return it to a known earlier state by addressing structural concerns, and ensuring its security and integrity for future use. Restoration is not aiming to retrieve the original state of the building; it rather should attempt to return the building to a better, less damaged state [34] (p. 17). Additionally, consideration will be given to redesigning the structure to evoke the former atrium layout, preserving its historical significance while accommodating modern programmatic needs that are compatible with the spatial configuration of the building. In contrast to the Women and Children Pavilion, the Administration Building holds potential for revival without compromising its physical structure or historical significance. These actions must adhere to established criteria for intervening in historic buildings, respecting previous periods’ interventions. Additionally, landscape design will enhance the exterior of the buildings, ensuring universal accessibility, while incorporating museography strategies to facilitate education and outreach efforts.

For the conservation strategy, a revision of the steps of the Burra Charter proposes the creation of policies for the protection of places with cultural significance [1]; the steps correspond to:

1. Understand the place: Define the place and its extent, and investigate the place, its history, use, associations, and fabric;
2. Assess cultural significance: Assess all values using relevant criteria, and develop a statement of significance;
3. Identify all factors and issues: Identify obligations arising from significance, and identify future needs, resources, opportunities, constraints, and conditions;
4. Develop policy;
5. Prepare a management plan: Define priorities, resources, responsibilities, and timing;
6. Implement the management plan.

Steps 1 and 2, involving the analysis of information to understand cultural significance, have been completed by the CP in the listing process. However, steps 3 and 4, regarding policy development and management, remain outstanding. Currently, while UPANACIONAL manages the site and the CP has provided general maintenance guidelines, a comprehensive conservation policy for the Sanatorio Duran is still lacking.

The Burra Charter provides a comprehensive framework for understanding Cultural Significance, encompassing various dimensions like the aesthetic, historical, scientific, social, and spiritual values inherent in a place [1], such as the Sanatorio Duran. Defining and comprehending these values is important for the elaboration of an effective conservation

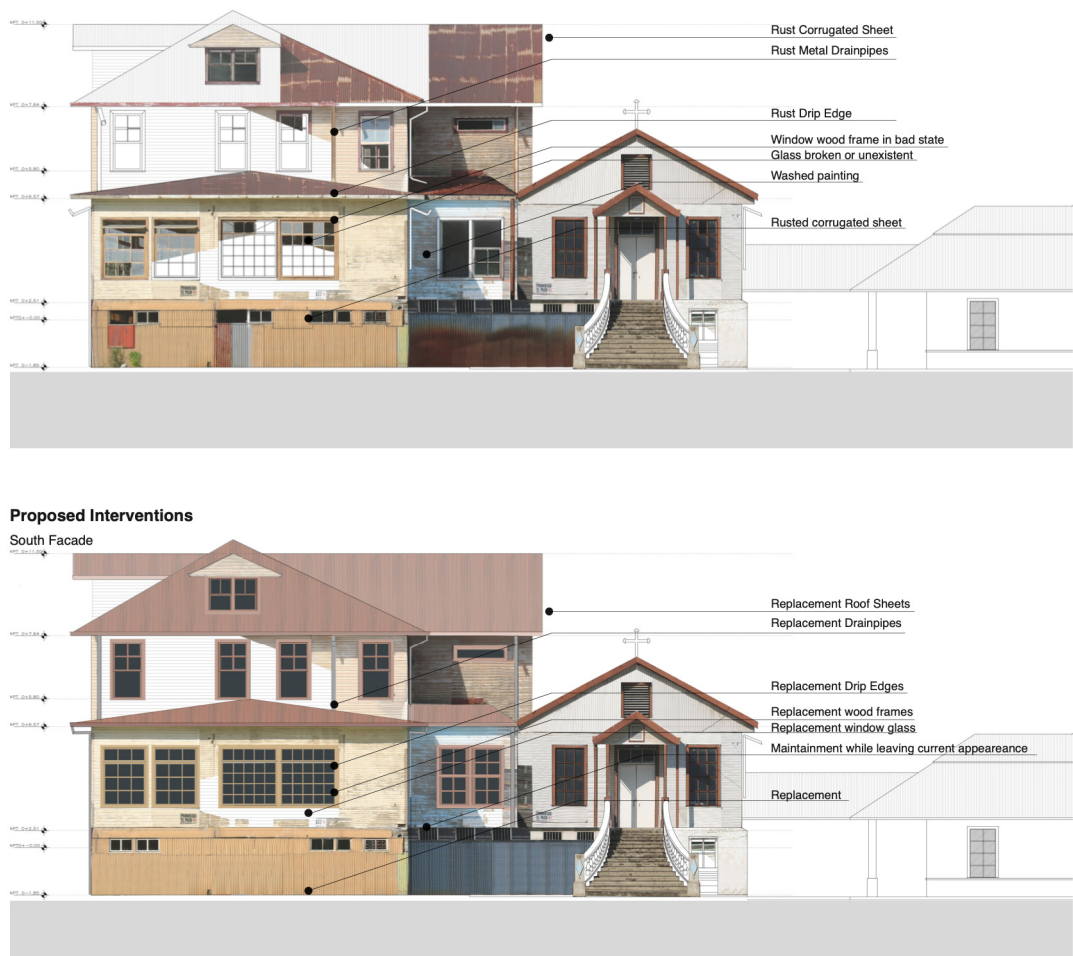
strategy that honors the site's heritage while accommodating contemporary needs. Conservation efforts must prioritize retaining the cultural significance of the site and integrating preservation practices into overall site management. This involves a cautious approach [1] to change, striving to minimize alterations to the original fabric of the place. Traditional methods and materials should be favored whenever possible, aligning with the charter's emphasis on utilizing all available knowledge, skills, and disciplines in conservation efforts. Additionally, conservation actions may entail retaining or reintroducing specific uses that align with the site's historical functions, while also considering the evolving social and cultural context. For the Sanatorio Duran, conservation scenarios involved maintaining the current condition of the emptiness of the Children and Women Pavilion to enhance its newly assigned value, alongside exploring options to re-establish the Administration Building's original functions. Ultimately, the conservation process seeks to strike a balance between preserving the site's original values and acknowledging its evolving significance in contemporary society [25].

In essence, drawing from the chosen scenarios and informed by the examination of the complex's values and the principles of the Burra Charter, the conservation strategy sets forth several primary objectives to guide the proposal.

1. Stop further deterioration of the complex while trying to keep as much as possible of the current appearance of the buildings;
2. Structurally reinforce the Administration Building, enabling the reintroduction of functional programming consistent with its original purpose, all while preserving the essence of its historical evolution;
3. Incorporate newly designed elements as reminiscent of the original design while respecting the established charters;
4. Comply with Costa Rican law 7600 of Universal accessibility in the whole complex;
5. Address mechanical and electrical problems, and propose a fire protection system;
6. To enhance both current and original values, educational and diffusion strategies will be incorporated, aimed at showcasing the site's historical significance and fostering a deeper understanding of its role in innovation and knowledge development;
7. Keep the self-sustaining condition of the sanatorium and provide the place of new tools and spaces for the generation of income, as suggested by step 5 of the Burra Charter;
8. Explore ways to attract external funding for future conservation projects.

Specifically, following Scenario 2, the restoration of the Administration Building aims to reintroduce its original administrative functions while incorporating spaces for exhibitions and communal activities, always considering the charters involved to make a successful and respectful restoration. To guide these interventions, a preliminary list detailing the building's elements, their damage, and potential solutions was compiled, emphasizing the conceptual nature of these proposals and the need for further detailed assessment [7] (art. 2.3, 2.5, 2.6, 2.7). Investigating the structure necessitates an interdisciplinary approach [7], transcending technical considerations, as historical research can unveil structural behaviors, and vice versa. Understanding the structure requires insights into its design, construction techniques, deterioration processes, alterations made over time, and its current condition [21] (p. 948).

Additionally, compliance with local regulations was assessed to determine the feasibility of interventions and to address technical considerations for future conservation efforts. Schematic exploration (Scheme 11) of the proposal involved the development of plans, façade designs, interventions, and functional axonometric diagrams. The objective was to preserve its essence while restoring habitability and reintroducing programmatic use. Considering its original function as administrative and medical offices, the intervention aimed to maintain spatial integrity and reintroduce compatible activities. Proposed uses included offices for UPANACIONAL administration, along with spaces for education and diffusion. Exterior materiality would be retained to showcase the building's historical significance, while a new design for the atrium would complement the existing structure.



**Scheme 11.** Orthophotos from the south facade of the Administration Building of the Sanatorio Duran, illustrating current situation and proposed interventions.

For the Pavilion, the primary strategy focused on preservation, aiming to maintain its current condition. For both the Administration Building and the Pavilion, as well as the landscape intervention, the incorporation of museographic strategies was considered crucial. These strategies would help educate visitors about the complex’s new values while also retrieving its original significance [26] (p. 373). Finally, it is essential to collaborate closely with the current owners to establish a stronger and more structured work team. This will ensure efficient and well-organized management of the complex. Key aspects include organizing and distributing tasks, and establishing operational guidelines to maintain the complex, monitor the physical structures of the buildings, and prevent recurring issues.

**6. Conclusions**

At its conception, the Sanatorio Duran stood as a unique complex in Central America [10], setting new standards both in medical practices and architectural design. Its pioneering nature not only revolutionized healthcare but also showcased architectural innovations, elevating its cultural significance within Costa Rican society. Its varied architecture reflects different historical periods, offering insight into how building styles evolved in the country during the early years of the 20th century. Following the comprehensive assessment of the complex’s value and the study of its architectural features, the condition of the sanatorium as a catalog of the evolution of Costa Rican architecture can be acknowledged. It serves as a reflection of the diverse architectural languages that have evolved over time in the country. The Sanatorio Duran’s significance extends beyond CR, warranting study in the context of similar facilities across Latin America. Examining its architectural quality within this broader context enhances understanding of its design and lasting impact.

Despite its enduring cultural significance in the collective consciousness of Costa Ricans, the current physical state of the Sanatorio Duran is quite deplorable. Abandoned and subjected to vandalism, its architectural integrity has been compromised, undermining its historical value. Although officially listed by the CP and overseen by UPANACIONAL, the absence of adequate conservation measures has resulted in ongoing decay. Despite efforts to enhance security, environmental factors pose significant challenges to its preservation. While some restoration work has been initiated, particularly in the landscape surroundings and the Dining Hall and Kitchen building in 2015, further action is imperative to ensure the long-term conservation of the Sanatorio Duran.

Given its multifaceted significance encompassing architectural, historical, and social dimensions, a comprehensive and proactive conservation strategy is essential. The objective of all studies, research, and interventions is to preserve the cultural and historical significance of the building in its entirety. Assessing a building often demands a holistic approach, considering it as a unified entity rather than merely examining individual components [21] (p. 946). The responsibility for upholding its original values relies on the hands of its keepers and in the hands of institutions like universities, which play an important role in raising awareness and fostering appreciation for its historical and cultural heritage.

The conservation strategy aimed to establish intervention guidelines for future proposals regarding the Sanatorio Duran. These guidelines were based on historical research and architectural analysis to identify its values and challenges. The research conducted followed the proposed conservation strategy for the Administration Building, Women and Children Pavilion, and their surroundings. Various intervention scenarios were proposed, drawing guidance from charters such as the Burra Charter, which offered valuable insights into the necessary steps for effective conservation processes. Throughout this process, the research aimed to outline possible conservation actions, although the proposal remained schematic in nature. Its purpose was to lay the groundwork for future, more comprehensive conservation strategies.

However, before implementing any conservation actions, a thorough evaluation and assessment of the complex's physical condition is essential to ensure a responsible, respectful and cautious approach [1]. The case of the Sanatorio Duran presents unique challenges due to its singular nature in the local context and the absence of comparable cases. Given this complexity, it is crucial to make well-informed decisions regarding any restoration efforts. Collaboration among various professionals is essential [7] (art. 2.1), as the Sanatorio Duran's significance extends beyond its architectural and physical aspects to encompass its social and cultural importance.

The Sanatorio Duran urgently requires preventive conservation [7] (art. 3.2) measures to stop its ongoing deterioration. However, with a comprehensive conservation strategy, including restoration efforts and effective management, it could potentially be transformed into a place for the dissemination of its institutional history and local heritage. Furthermore, it has the potential to serve as a center for innovation and training, aligning with current activities in the area while revitalizing its past role as a development pole. This approach would involve using values such as innovation and self-sustainability that were integral to the sanatorium's bright years and adapting them to contemporary processes and needs.

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