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Inventory of Real Estate Assets of the Trans-Andean Railroad in the 'Alausí - Bucay' Section: A Study of Valuation and Preservation of the Railroad Heritage

Inventario de Bienes Inmuebles del Ferrocarril Trasandino en el Tramo 'Alausí - Bucay': Un Estudio de Valoración y Preservación del Patrimonio Ferroviario

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ABSTRACT

Heritage inventories are valuable resources often used to manage, promote and preserve the cultural and natural assets existing in a given area. These inventories often become the basis for the formulation of policies related to heritage protection and conservation; in addition, they play an important role in the dissemination and promotion of these assets. This article presents an exhaustive study on the inventory of real estate heritage assets of the trans-Andean railroad in the 'Alausí - Bucay' section. The main objective of this research was to make an accurate assessment and encourage the preservation of the railway heritage in the region. Through a research approach based on the collection of documentary data and field work to obtain primary information, a total of 80 real estate heritage assets were identified, including terminals, stations, tunnels, bridges and lodging facilities. The findings of the study revealed the remarkable architectural and cultural richness of the

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existing immovable heritage assets. The conclusions highlight the relevance of preserving these elements as a fundamental part of the region's historical and cultural legacy and also recommend the adoption of measures that allow for greater knowledge of these assets and their interaction with the surrounding natural and social environment.

RESUMEN

Los inventarios del patrimonio son recursos valiosos que suelen utilizarse para gestionar, promover y conservar los bienes culturales y naturales existentes en una zona determinada. Estos inventarios se convierten a menudo en la base para la formulación de políticas relacionadas con la protección y conservación del patrimonio; además, desempeñan un importante papel en la difusión y promoción de estos bienes. Este artículo presenta un estudio exhaustivo sobre el inventario de bienes patrimoniales inmuebles del ferrocarril trasandino en el tramo 'Alausí - Bucay'. El objetivo principal de esta investigación fue realizar una evaluación precisa y fomentar la preservación del patrimonio ferroviario en la región. A través de un enfoque de investigación basado en la recopilación de datos documentales y trabajo de campo para obtener información primaria, se identificaron un total de 80 bienes patrimoniales inmuebles, incluyendo terminales, estaciones, túneles, puentes e instalaciones de alojamiento. Los resultados del estudio revelaron la notable riqueza arquitectónica y cultural de los bienes patrimoniales inmuebles existentes. Las conclusiones destacan la relevancia de preservar estos elementos como parte fundamental del legado histórico y cultural de la región y recomiendan asimismo la adopción de medidas que permitan un mayor conocimiento de estos bienes y de su interacción con el entorno natural y social que los rodea.

Keywords / Palabras clave

Bienes patrimoniales inmuebles, Ferrocarril, Valoración, Preservación, Patrimonio ferroviario

Real estate, Railway, Railway heritage, Valuation, Preservation, Railway heritage, Railway heritage

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Introduction

Regarding the definition of heritage, in order to establish a clear idea, we start from the premise that cultural heritage encompasses various elements, both tangible and intangible, that we have received as a legacy from the past and that we consider valuable to preserve as an integral part of our identity and historical narrative. (Teixeira & Weissmann-da Silva, 2022). (Blanco-Ramírez, 2017)Heritage refers to the set of cultural and natural assets present in a territory, which constitute the identity of the place and the people who inhabit it. (Villarreal & Rizo, 2023). (UNESCO, 2017).

The United Nations Educational and Cultural Organization (UNESCO) emphasizes that cultural heritage has acquired a fundamental role as an engine of economic and social development, especially through the tourism sector. Keeping detailed records of existing heritage elements, in addition to being an instrument for the management, protection and dissemination of cultural and natural assets, are highly useful for raising awareness of their importance in shaping individual and collective identities (UNESCO, 2017) (Castellanos Gutiérrez et al., 2019).. Digital technologies such as 3D scanners, photogrammetries, detailed photographic records, etc., currently allow for the creation of thorough heritage inventories with a higher level of reliability (Jaramillo Uribe, 2021). (Blaya et al., 2017).

With respect to heritage conservation and management, it is important to highlight that UNESCO and its advisory bodies such as ICOMOS (International Council on Monuments and Sites) have developed numerous documents including recommendations, charters, principles, among others. These documents have had a wide influence at the international level, both in terms of doctrinal and conceptual approaches as well as in the formulation of national legislation in different countries. (Barreto, 2020) (Conforti et al., 2021)..

Heritage in Ecuador

In Ecuador, the National Institute of Cultural Heritage (INPC), is since 1978 the institution that by law has the function of conserving, preserving, exhibiting, researching, promoting and restoring the Cultural Heritage of Ecuador. It currently has the Cultural Heritage Information System of Ecuador (SIPCE), which is an information technology tool used nationally for the registration of cultural heritage,

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and is organized into five categories called funds: intangible heritage, immovable, movable, documentary and archaeological. The main objective of this platform is to store, organize and classify data relevant to the management of cultural heritage, specifically for each of the aforementioned funds. (INPC, 2023).

The category analyzed in this article is that of immovable heritage, which can be defined as works that cannot be moved from their place of origin without losing their essence and that, because of their historical, symbolic and/or cultural value, allow us to interpret the behavior of societies over time. Among the main exponents of this heritage category are religious, funerary, vernacular, civil and industrial architecture; as well as squares, parks, mills, farmhouses and other engineering works such as bridges, roads and railways. (Magaz Molina, 2021) (INPC, 2023)In this sense, railroad heritage encompasses many of these subcategories.

It is important to mention that the National Institute of Regional Cultural Heritage 03, in the exercise of its attributions and competencies, held training workshops (Inventory - Conservation of Cultural Properties and management of the SIPCE system) to technical delegates of the Municipal Government of Alausí canton prior to the development of this research, where it was emphasized the need for the information regarding the registration of properties of heritage interest and inventory of properties and manifestations of cultural heritage in its jurisdiction to be incorporated into the Information System of Cultural Heritage of Ecuador SIPCE.

Railway Heritage

It is important to recognize the cultural impact bequeathed by a railroad system, despite being a past relatively close in time to the present. In this sense, it is crucial to highlight the values that distinguish it in order to achieve a rigorous, technical and scientific interpretation of its unique identity. The heritage elements inherited from former railway operations (real estate) are considered part of the industrial heritage due to the close relationship between transport systems and the heritage of the "industrial revolution" in a territory (Pinassi, 2014) (Villarreal & Rizo, 2023)..

The evolution of the railway network constitutes a manifestation of industrial heritage, representing a vestige of industrial culture. This legacy comprises a series of resources that define specific spaces and contribute to collective identity. When addressing the heritage

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discourse related to a railroad, it should be recognized that it is a set of tangible and intangible elements that make up a complex system, which interacts in a transversal manner with the natural, social and cultural environment (Borges, 2021) (Villarreal & Rizo, 2023)..

Property inventories

The word "inventory" has its roots in the Latin term "inventarium", which means "list" or "catalog of things". It comes from the verb "invenire", which translates as "to find" or "to find", and its most common use is in the legal field. It refers to the enumeration of goods, whether movable, immovable, tangible, intangible, natural, among others, accompanied by a detailed description. This process is carried out with the purpose of documenting the patrimony of a person, family, company or community. (Teixeira & Weissmann-da Silva, 2022).

Inventories have been fundamental in the emergence of the field of heritage preservation centuries ago. They emerged as a means of generating new knowledge through the collection and systematization of information according to specific standards and analyzable and classifiable data sets. Today, they continue to be essential tools for the identification, valuation and protection of cultural heritage assets. In this sense, the concept of inventory plays a key role in the trajectory of preservation practices, as it is intrinsically related to the conceptualization itself of what constitutes cultural heritage (Lopes, 2021) (Motta & Rezende, 2016).

Ecuador, with respect to heritage inventories, points out that they play an indispensable technical role in the management and control of heritage assets. Their central objective is to identify and evaluate these assets, as well as to determine their state of conservation and the necessary levels of protection and intervention. It is a dynamic and constantly evolving tool that lays the groundwork for the formulation of policies to preserve and protect cultural heritage. (INPC, 2023).

The methodology proposed by the author Lopes (2021) establishes that the inventory is the main form of recognition and management of railway heritage. This methodology sets out guidelines for carrying out the process through an adequate collection and recording of relevant information about the property. It also highlights the importance of understanding the meaning and function of railway heritage according to its typology. (Villarreal Quevedo & Rizo Aguilera, 2023)..

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In recent decades, there has been significant progress in heritage management in public institutions, with improvements in operating procedures related to heritage activities. The adoption of information and communication technologies has facilitated the tasks and allowed a greater integration of the various sectors involved in the control process, several of these tools allow addressing the challenges of preservation of railway heritage with greater effectiveness (Romero de Oliveira, 2021)..

In addition, there has been an increase in the training of professionals in the field of heritage, who have acquired specialized knowledge to carry out their functions more effectively. Likewise, the importance of accountability to control bodies has been recognized, which has driven greater transparency and accountability in heritage management (Carvalho & Auxiliadora, 2019)..

The Trans-Andean Railroad

The history of the railroad in Ecuador dates back to April 23, 1861, when President Gabriel García Moreno decreed the construction of this infrastructure. Given the challenging track landscape and the risks associated with travel on unsafe roads and diseases, this decision was made with the objective of improving communication between the coastal and mountainous regions of the country (Garcia Rios, 2019). Known as "The most difficult train in the world" due to the practically insurmountable obstacles of the Andean mountain range, the Ferrocarril del Sur, also called Ferrocarril Trasandino, which connects the cities of Guayaquil and Quito, stands out as one of the most significant works in the history of Ecuador. Prior to its construction, Ecuadorian society experienced a marked disintegration due to the considerable distances separating the main cities on the coast and in the highlands. At that time, the only means of heavy transport in the country were the mule and the guandos, which carried the heaviest loads. (Avilés Pino, n. d.).

It is important to mention that the information presented here is an extract of the work "VERIFICATION IN THE SIPCE SYSTEM, AS IN FIELD, OF THE PROPERTY PROPERTY (REAL ESTATE) BELONGING TO THE RAILWAY, AND WHICH ARE INVESTED IN THE TRAM "ALAUSÍ - BUCAY", delivered to the INPC-R3 Zonal Directorate.

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Materials and Methods

Study area

The Alausí-Bucay section of the Trans-Andean Railroad Cultural Itinerary covers an area of interest with an approximate distance of 54.3 km, following the course of the Chanchan River. It starts at Bucay Station, Guayas province, heading south towards the Cumandá canton, Chimborazo province. From the second bridge that crosses the train to the Ochoa station, the route shares the provincial limits of Cañar and Chimborazo, the rest of the route continues in the province of Chimborazo covering the cantons of Alausí and Chunchi. This zone is geographically located in:

Table 1. *Territorial location of the Alausí-Bucay section included in the study.*

Province	Canton	Parish
Chimborazo	Alausi	(Alausí, Sibambe, Pistishi and Huigra)
	Chunchi	(Chunchi and Capzol)
	Cumanda	Cumanda
Cañar	Cañar	(Ventura and General Morales)
Guayas	Bucay	General Antonio Elizalde

Source: Own elaboration based on. García Ríos (2018, 2019)

As can be seen in Table 1 and Figure 1, along the train route, there are 8 localities with relatively low demographic and economic dynamics, with the exception of the main stations of Alausí, Bucay and Huigra. According to data from the population and housing censuses of 2001 and 2010, a population decrease is observed in the parishes of General Morales (-22%), Huigra (-13%), Sibambe (-11%), and Capzol (-10%) (García Ríos, 2018)(Guevara, 2018).

Figure 1. Political-Administrative Division, Bucay-Alausí section of the Bucay-Alausí railroad.

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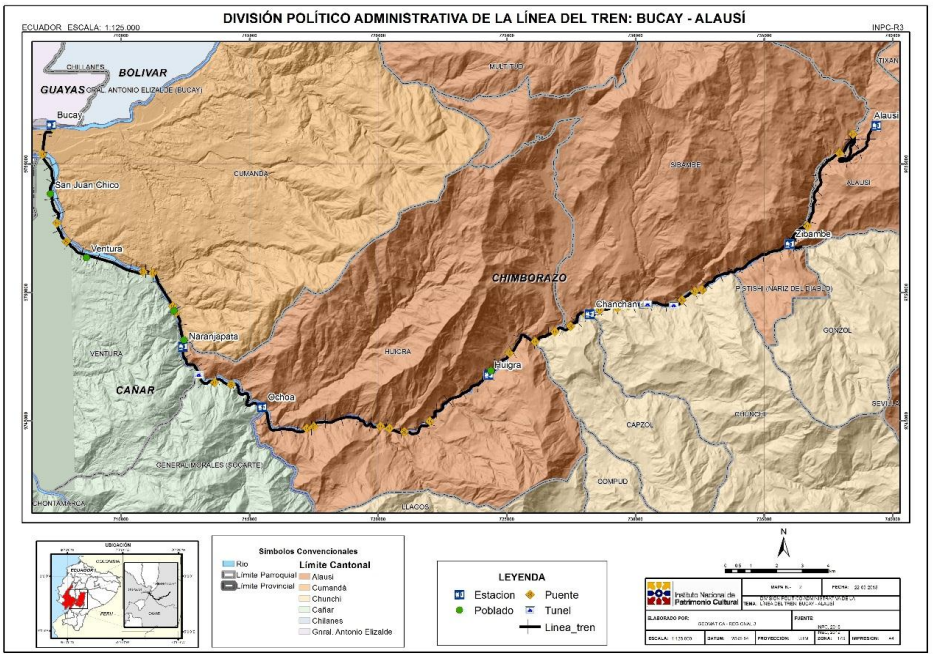

Source: Recovered from Geomatics Tech. Inf. - INPCR3-GM-2018-0018. (Guevara, 2018)

Compilation and registration of patrimonial assets

The methodology used consists of two important components, field and office work, which are described in more detail in the following table:

Table 2. *Research methodology used*

Field work	Office work
Field visit to the real estate	If the properties have a physical (paper) inventory card, the inventory card will be updated in the SIPCE system in accordance with the legal regulations in force.
Baseline survey of real estate assets (stations, camps, water tanks, Chimbuzos, etc.).	If the properties have a heritage interest file, the work will be coordinated in accordance with the legal regulations in force for updating the inventory file in the SIPCE system.
Photographic record of	If the properties are not inventoried and once identified, they meet the technical criteria for

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interiors, exteriors and panoramic views, whether or not they have heritage value.	identification of properties with cultural characteristics, the work is coordinated in accordance with the legal regulations in force for the compilation of the inventory card in the SIPCE system. If the properties are not inventoried and, once identified, do not meet the technical valuation criteria, they will simply be mentioned in the final report.

Source: Own elaboration based on (García Ríos, 2019)

In the process of compiling the information and registering the heritage assets, multiple technical meetings were held with several technicians cataloging movable and immovable assets, technicians from INPC Z3, the INPC-R3 Zonal Technical Directorate, analyst technicians from Regional Geomatics, representatives from the Alausí GAD and representatives from the Ecuadorian Railroads Management.

During these technical sessions, consultations were held on the existing heritage assets in the study area, their location, state of conservation and current uses. At the same time, a documentary review was carried out, including computer graphics, records, and various maps. As a result of these activities, a list of properties that are inventoried and should be verified was obtained.

For non-inventoried properties, it is proposed to contemplate the provisions of Art. 40 of the Organic Law of Culture and Art. 94 of the Law of Culture regarding the incorporation of information to the Information System of the Cultural Heritage of Ecuador and the identification, registration and inventory of recognized or declared properties.

Subsequently, a route map and a preliminary schedule of the tours were drawn up to carry out the documentary record of the properties, this between the months of March and September 2018. Based on the visits, descriptive cards were built for each of the heritage properties containing the following information: card code, denomination, construction period, province, canton, parish, year and declaration.

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Results

The following information was obtained from the SIPCE, as well as from the files of the INPC R3 Technical Control Directorate.

There are two ministerial agreements (No. 029 and No. 02520) enacted in 2008 and 2004 respectively. In these agreements, the Railway Network of Ecuador "Civil Monument and Historical Symbolic Testimonial Heritage" composed of terminals, stations, tunnels, bridges and lodging headquarters of the foreign technicians who were involved in the construction of the railway line, as well as declaring the historical area of the city of San Pedro de Alausí, existing buildings and urban spaces, as belonging to the Cultural Heritage of the Nation, is declared as a property of the State. (García Ríos, 2019).

With the above-mentioned background, we can point out some of the relevant results in the inventory.

- In the Huigra parish, of the thirteen (13) properties that are part of the built urban context of the railroad track, described in Table 3, only nine (9) have a physical inventory card, one (1) has a registration card under the emergency decree and three (3) are not inventoried. Of the total, only four (4) belong to Empresa de Ferrocarriles del Ecuador and two (2) have generated use by the same company and seven (7) are privately owned.

Table 3. *Inventoried/non-inventoried Immovable Cultural Properties, as urban context to the railroad in the parish of Huigra.*

HUIGRA

NO.	Designation	Physical Inventory Card Code	Inventory Update	Inventory	Year	Declaration/ Heritage
1	Eloy Alfaro School	4H159-99-1	X		1923	Organic Law on Culture
2	Railwaymen's Union	4H159-99-2	X		± 1940	Ministerial Agreement 029
3	Housing	4H159-99-3	X		± 1940	Organic Law on Culture
4	Railroad Station	4H159-99-5	X		± 1910	Ministerial Agreement 029
5	Monument to Eloy Alfaro	4H159-99-6	X		1928	Organic Law on Culture
6	Urban Complex	4H159-99-8	X		To be verified	To be verified

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7	Housing/Eating	4H159-99-9	X			To be verified	To be verified
8	Urban Complex	4H159-99-10	X			To be verified	To be verified
9	Railroad Management	4H159-99-11	X			± 1920	Ministerial Agreement 029
10	Railroad Workers' Residence	Not inventoried			X	To be verified	Ministerial Agreement 029
11	Urban Complex	BI-06-02-54-000-000017			X	To be verified	To be verified
12	Villas for foreign railroad technicians	Not inventoried			X	To be verified	Ministerial Agreement 029
13	Water reservoir tank/steam machines	Not inventoried			X	To be verified	Ministerial Agreement 029
Subtotal			9		4		(4) To be verified

Source: Own elaboration based on (García Ríos, 2019)

- For the city of Alausí, 13 properties were also identified as part of the built urban context of the railroad track of the "Alausí-Bucay" section, which are described in Table 4, all of which have physical inventory records. Two (2) of these properties belong to Empresa de Ferrocarriles del Ecuador and eleven (11) are privately owned.

Table 4. *Inventoried/non-inventoried Immovable Cultural Property, as urban context to the railway in the city of Alausi*

ALAUSÍ

NO.	**Designation**	**Physical Inventory Card Code**	**Inventory Update**	**Inventory**	**Year**	**Declaration/ Heritage**
1	Black Bridge	4H-164-04-241	X	X	To be Verified	Ministerial Agreement 029
2	Alausi Sports League	4H-164-04-172	X		To be Verified	Ministerial Agreement 2520
3	Housing	4H-164-04-171	X		To be verified	Ministerial Agreement 2521
4	Housing	4H-164-04-131	X		To be verified	Ministerial Agreement 2521
5	Factory/Occupied	4H-164-04-130	X		To be verified	Ministerial Agreement 2521
6	Housing/Residential	4H-164-04-082	X		24/3/1905	Ministerial Agreement 2521
7	Housing	4H-164-04-083	X		21/3/1905	Ministerial Agreement 2521
8	Housing	4H-164-04-084	X		1905	Ministerial Agreement 2521

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9	Housing	4H-164-04-085	X			21/3/1905	Ministerial Agreement 2521
10	Housing	4H-164-04-089	X			1910 - 1915	Ministerial Agreement 2521
11	Housing	4H-164-04-088	X			3/4/1915	Ministerial Agreement 2521
12	Housing	4H-164-04-087	X			21/3/1905	Ministerial Agreement 2521
13	Railroad Station	4H-164-04-086	X		X	1905-1929	Ministerial Agreement 029
Subtotal			13		2		

Source: Own elaboration based on (García Ríos, 2019)

- By means of a direct route from the Alausí station to the Bucay station, along the railroad track, a total of sixty-four (64) heritage assets that are part of the Railroad Network were identified and quantified. All these assets can be seen in more detail in the following table:

Table 4. *Heritage real estate as part of the "Alausí - Bucay" section of the railway line*

REAL ESTATE LOCATED IN THE RAILWAY NETWORK "ALAUSÍ - BUCAY" SECTION

NO.	Designation	Description	Physical Inventory Card Code	Inventory	Sector	Abscissa	Year	Declaration/ Heritage
1	Old Camp	Oil Reservoir	s/n	X	Alausí (Eloy Alfaro Street)	143Km	±1901	Ministerial Agreement 029
2	Bridge	Box girder bridge with top beams Light 13.50 m	s/n	X	Alausí (Curva de los molinos)	139Km+ 170m	±1901	Ministerial Agreement 029
3	Water tank	Water tank for steam engines	s/n	X	Alausi	138Km+ 320m	±1901	-----
4	Bridge	Light box bridge 19.60 m	s/n	X	Alausi	138Km+110m	±1901	Ministerial Agreement 029

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5	Bridge	Light box bridge 16.50 m	s/n	X	Sibambe	134K m+750m	±1901	Ministerial Agreement 029
6	High Zig-Zag	Maneuvering in the Devil's Nose	s/n	X	Sibambe	133K m+500m	±1901	Ministerial Agreement 029
7	Low Zig-Zag	Maneuver at the Devil's Nose (change of rail)	s/n	X	Sibambe	132K m+400m	±1901	Ministerial Agreement 029
8	Chimbuzo	Used for steam engines	s/n	X	Sibambe	131K m+500m	±1901	----
9	Station	Sibambe Station	s/n	X	Sibambe	131K m+560m	±1901	Ministerial Agreement 029
10	Bridge	Arch Bridge Span 20.70 m	s/n	X	Sibambe	131K m+590m	±1901	Ministerial Agreement 029
11	Bridge	Arch Bridge Light 7.40 m	s/n	X	Sibambe Bowling	127K m+210m	±1901	Ministerial Agreement 029
12	Bridge	Light box bridge 18,30 m	s/n	X	Sibambe Bowling	127K m+220m	±1901	Ministerial Agreement 029
13	Bridge	Drawer Bridge upper structure. Span 24.20 m	s/n	X	Sibambe Bowling	126K m+600m	±1901	Ministerial Agreement 029
14	Tunnel (known as Chanchan's small tunnel).	Length: 24.50 m; Width: 5.10 m; Height: 5.10 m	s/n	X	Bowling	126K m+180m	±1901	Ministerial Agreement 029
15	Tunnel (known as Chanchan Tunnel)	Length: 846,00; Width: 5,0m; Height: 6,20m	s/n	X	Zusnia	125K m+142m	±2010 - 2012	Ministerial Agreement 029

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16	Bridge	Drawer Bridge upper structure. Span 29.90 m	s/n	X	Sibambe	124K m+996m	±2008	Ministerial Agreement 029
17	Tunnel (known as Chanchan Tunnel)	Length: 82,20 m; Width: 3,70 m; Height: 4,90 m	s/n	X	Zusnia	124K m+970m	±1901	Ministerial Agreement 029
18	Bridge	Light box bridge 19.70 m	s/n	X	Sibambe	124K m+380m	±1901	Ministerial Agreement 029
19	Bridge	Box girder bridge with lower beams. Span 29.15 m	s/n	X	Chanchan	123K m+920m	±1901	Ministerial Agreement 029
20	Bridge	Drawer Bridge Light 20.20 m	s/n	X	Chanchan	123K m+180m	±1901	Ministerial Agreement 029
21	Tunnel	Length: 56.00 m; Width: 4.4 m; Height: 5.2 m	s/n	X	Chanchan	123K m+100m	±1901	Ministerial Agreement 029
22	Bridge	Drawer Bridge upper structure. Span 17.70 m	s/n	X	Chanchan	123K m+080m	±1901	Ministerial Agreement 029
23	Station	Chanchan Railway Station	s/n	X	Chanchan	122K m+750	±1901	Ministerial Agreement 029
24	Bridge	Drawer Bridge upper structure. Span 19.30 m	s/n	X	Chanchan	122K m+700m	±1901	Ministerial Agreement 029
25	Bridge	Drawer Bridge. Span 22.8 m	s/n	X	Chanchan	122K m+ 560m	±1901	Ministerial Agreement 029

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26	Cross	Memorial cross dedicated to deceased railroad workers	s/n	X	Chanchan	122K m+40 0m	s/n	s/n
27	Bridge	Lower Beam Bridge Lower Span 38.30 m	s/n	X	Chanchan	121K m+60 0m	±1901	Ministerial Agreement 029
28	Bridge	Drawer Bridge upper structure. Span 24.20 m	s/n	X	Chanchan	120K m+64 0m	±1901	Ministerial Agreement 029
29	Bridge	Light box bridge 21.10 m	s/n	X	Huigra	119K m+95 0m	±1901	Ministerial Agreement 029
30	Bridge	Light box bridge 21.25 m	s/n	X	Huigra	118K m+45 0m	±1901	Ministerial Agreement 029
31	Water chimbuzo	Used for steam engines	s/n	X	Huigra Station	116K m	±1901	----
32	Water chimbuzo	Used for steam engines	s/n	X	Huigra Station	116K m	±1901	----
33	Bridge	Bridge with Lower Girders Span 25,80 m	s/n	X	Huigra	114K m+07 0m	±1901	Ministerial Agreement 029
34	Bridge	Arch Bridge Span 41.15 m	s/n	X	Olympus	112K m+80 5m	±1901	Ministerial Agreement 029
35	Bridge	Beam Bridge Span 7.40 m	s/n	X	Olympus	112K m+18 0m	±1901	Ministerial Agreement 029
36	Bridge	Beam and Arch Bridge Span 10.75 m and 29.90 m	s/n	X	Olympus (Eagle's curve)	111K m+76 0m	±1901	Ministerial Agreement 029
37	Bridge	Arch Bridge Light 37,80m	s/n	X	Olympus	108K m+81 5m	±1901	Ministerial Agreement 029

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38	Bridge	Lower Beam Bridge Span 35,30 m	s/n	X	Olympus	108K m+475m	±1901	Ministerial Agreement 029
39	Water Tank	Water reservoir for steam engines	s/n	X	Ochoa (Olimpo)	108K m+200m	±1901	-----
40	Bridge	Drawer bridge in upper structure Span 24.10 m	s/n	X	Ochoa	106K m+080m	±1901	Ministerial Agreement 029
41	Station	Ochoa Station	s/n	X	Ochoa	105 km	±1901	Ministerial Agreement 029
42	Bridge (dry bridge)	Light box bridge 9.50 m	s/n	X	Ochoa	103K m+960m	±1901	Ministerial Agreement 029
43	Bridge	Light Box Bridge 12.15 m	s/n	X	Ochoa (Naranjapata Waterfall)	103K m+185m	±1901	Ministerial Agreement 029
44	Water channel in ashlar stone	Water reservoir for steam engines	s/n	X	Ochoa	102K m+600m	±1901	-----
45	Bridge	Drawer Bridge in upper structure span 20.90m and in girders span 13.70 m (two bridges)	s/n	X	Naranjapata	102K m+423m	±1901	Ministerial Agreement 029
46	Tunnel	Length: 30.00; Width: y/n; Height: y/n	s/n	X	Naranjapata	102K m+400m	±1960	Ministerial Agreement 029
47	Naranjapata Station	Abandoned /Ruinas	BI-06-10-50-000-000001	X	Naranjapata	101K m+50	±1901	Ministerial Agreement 029

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48	Workshop	Machine maintenance/Abandoned	s/n	X	Naranjapata	101Km+030m	±1901	Ministerial Agreement 029
49	Tank	Oil reservoir	s/n	X	Naranjapata	100Km+830m	±1901	----
50	Bridge	Arch Bridge Span 31.80 m	s/n	X	Naranjapata	100Km+830m	±1901	Ministerial Agreement 029
51	Bridges	2 bridges: Arch and Beams Span 31.10 m Span 13.15 m	s/n	X	Chilincay	99Km + 570m	±1901	Ministerial Agreement 029
52	Old Bridge	Abandoned Arch Bridge	s/n	X	Ventura	99 km+ 400m	±1901	Ministerial Agreement 029
53	Ventura Station	Abandoned	s/n	X	Ventura	92Km +600 m	±1901	Ministerial Agreement 029
54	Cemetery	Requires inspection of possible movable property	s/n	X	Ventura	92Km +400 m	±1901	----
55	Bridge	Drawer Bridge in upper structure Span 18,30 m	s/n	X	Ventura	92Km +035 m	±1901	Ministerial Agreement 029
56	Bridge	Drawer Bridge in upper structure Light 15.25 m	s/n	X	Ventura	91Km +215 m	± 1901	Ministerial Agreement 029
57	Bridge	Beam Bridge Span 7 m	s/n	X	Ventura San Juan	90Km+170 m	± 1901	Ministerial Agreement 029
58	Bridge	Arch Bridge Span 44.10 m	s/n	X	Cumanda	88Km+260 m	±1901	Ministerial Agreement 029
59	Bridge	Beam Bridge Span 9.30 m	s/n	X	Cumanda	87Km +080 m	±1901	Ministerial Agreement 029

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60	Bridge	Arch Bridge Span 31.70 m	IBI-09-27-50-000-000005	Maintain Inventory File	Cumanda	87Km +010 m	1912	Ministerial Agreement 029
61	Residence	Railroad workers' residence /Abandoned	s/n	X	Bucay	86Km +80m	±1901	---
62	Workshop	Machine maintenance /Abandoned	BI-09-27-50-000-000000 IBI-09-27-50-000-000001	Maintain Inventory File	Bucay	86Km +30m	±1901	Ministerial Agreement 029
63	Warehouse and Warehouse	WAREHOUSING AND STORAGE, ECUADORIAN RAILROADS COMPANY	IBI-09-27-50-000-000003	Maintain Inventory File	Bucay	86Km +20m	1910	----
64	Station	Bucay Station	s/n	X	Bucay	86 km	±1901	Ministerial Agreement 029

Source: Own elaboration based on (García Ríos, 2019)

Of the real estate described in the previous table, thirty-seven (37) are bridges; six (6) are stations; six (6) water reservoirs with chimbuzos; five (5) are tunnels; two (2) oil reservoir tanks; two (2) maintenance workshops; two (2) relevant maneuvers (zigzag) at the Devil's Nose; one (1) railroad workers' residence; one (1) commemorative cross; one (1) cemetery; and one (1) warehouse and storage. It should also be mentioned that the missing station (Alausí) and cemetery (Sibambe) were listed in the preceding tables, so they are not counted again in this one.

Taking into consideration that a great number of existing real estate assets in the "Alausí - Bucay" section of the Trans-Andean Railroad have not been inventoried, it is of concern that many more have disappeared due to natural phenomena and disasters, however, they are an integral part of the history of this railroad. In this sense, it is essential to carry out a rigorous inventory of these elements in order

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to obtain a complete knowledge of this railroad heritage. This process of information gathering has required considerable time and effort, due to the fact that access to some areas presents a high level of difficulty. There is a broad context surrounding this section, including aspects related to cultural landscapes, technology, engineering and interaction with nature.

Considering the wide diversity of aspects related to the railway heritage in sections such as "Alausí - Bucay", some complementary research topics can be established.

A first point would be to analyze the influence of this type of heritage on local tourism and economic development, exploring in more detail how the preservation and promotion of railroad heritage in the area of the "Alausí - Bucay" section has impacted the region.

The relationship between railway heritage and the sense of local cultural identity could also be studied, examining how the presence and preservation of railway heritage has influenced the sense of belonging, identity construction and rootedness of the local community in relation to its railway history. This could be complemented as an analysis of the influence of railway heritage on daily life, traditions and cultural practices, providing an enriching anthropological perspective to understand the interaction between society and the railroad.

From a technical and infrastructural point of view, research can be conducted on the construction techniques and materials used in railway heritage assets, focusing mainly on architectural techniques and the materials used in the construction of stations, bridges and tunnels, with the aim of deepening technical knowledge and contributing to the conservation and restoration of all these elements.

From an environmental sustainability approach, it would be important to assess the environmental impact of the railroad on the surrounding area, addressing the effects of the railroad on the natural environment and existing ecosystems along the "Alausí - Bucay" section and examining some essential aspects such as habitat fragmentation, alteration of water flows and biodiversity conservation.

All these additional hypotheses could broaden the understanding of the railway heritage in the "Alausí - Bucay" section from different perspectives, fostering a multidisciplinary approach and contributing

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to the preservation, valuation and integral promotion of this important historical and cultural legacy.

Conclusions

Although all of the properties visited are part of the Railway Network, some of them are have lost their heritage characteristics and values, especially the buildings. According to the proposed methodology, some of these buildings do not meet the necessary criteria to be included in the inventory as National Cultural Heritage; on the other hand, the properties that do remain are being subjected to valuation and inventory processes in order to determine their heritage significance.

Due to limitations of time, economic resources and personnel, it was not possible to visit all the elements that make up the railroad network in the province of Chimborazo. However, it is recognized the need to program future interventions in the annual operational plans of the respective institutions in order to be able to thoroughly address the study and evaluation of the entire railroad network.

Similarly, it is important to mention that, based on meetings held with the Comité Gestor Itinerario Cultural del Ferrocarril Transandino, in order to strengthen the candidacy of the Alausí- Bucay section as a candidate for World Heritage, it is necessary for the INPC to formalize the commitments made by each institution directly or indirectly involved in the process, thus allowing the delimitation of future actions.

From the technical inspections for the collection of information, it was concluded that:

Of the thirteen properties that are part of the built urban context of the railroad track in the Huigra parish, nine have a physical inventory card, one has a registration card under the emergency decree and three are not inventoried. Two of them are owned by Empresa de Ferrocarriles del Ecuador and seven are privately owned. In the framework of the aforementioned, it can be said that nine properties require updating the inventory and four require the completion of the inventory of real estate, as well as the verification of information to designate the procedure of belonging to the Immovable Cultural Heritage of Ecuador.

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The thirteen properties that are part of the built urban context of the railroad track of the "Alausí-Bucay" section in the city of Alausí, have a physical property inventory card, two of them are owned by Empresa de Ferrocarriles del Ecuador and eleven are privately owned. All thirteen have a declaration as Cultural Heritage of Ecuador in force, however, they require an update of the inventory of real estate.

Of the sixty-four assets identified on the railroad track, fifty-six are real property and eight are personal property; with respect to real property, three have inventory cards (to be updated), only one has a registration card (emergency decree) and the remaining sixty are not registered or inventoried. Sixty-three belong to the Empresa Pública de Ferrocarriles del Ecuador and one belongs to the GAD Parroquial de Ventura. In the sense of the aforementioned, it is concluded that fifty-nine require an inventory of real estate (bridges, stations, tunnels, workshops, relevant maneuvers); three require an update of the inventory; and two require additional analysis and inspection. It is also important to mention that fifty-three of the sixty-four mentioned are already declared as Cultural Heritage of Ecuador under Ministerial Agreement 029.

As could be observed in the present research, the absence of a detailed inventory of the Railroad's immovable heritage assets generates a series of significant challenges that hinder their management and conservation. The lack of an accurate record of these cultural assets prevents a precise understanding of their number, architectural characteristics, state of conservation and historical and cultural relevance. This limits the ability to make informed decisions and formulate effective policies for their protection, valuation and promotion.

It is also important to recognize the latent risk of loss of valuable architectural and cultural elements due to lack of proper care and attention. In addition, the lack of accurate information on immovable heritage assets hinders the effective promotion of railway heritage as a potential tourist attraction. This first approach is intended as a basis for a more detailed study to gather data that will allow informed decisions, formulate effective policies, allocate adequate resources, promote cultural tourism and ensure the long-term protection of these historical and cultural assets.

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References

Avilés Pino, E. (n. d.). Ferrocarril Ecuador: Enciclopedia del Ecuador. http://www.enciclopediadelecuador.com/historia-del-ecuador/ferrocarril-ecuador/.

Barreto Lira, F. (2020). Desafios contemporâneos da significância cultural, integridade e autenticidade do patrimônio cultural: teoria e prática. Oculum Ensaios, 17, 1. https://doi.org/10.24220/2318-0919v17e2020a4365

Blanco-Ramírez, D. M. (2017). Cultural management of heritage in Viotá, Cundinamarca. Revista de Arquitectura, 19(1), 16-27. https://doi.org/10.14718/revarq.2017.19.1.900

Blaya, F., Nuere, S., Islán, M., & Reyes-Téllez, F. (2017). Application of digitization for the study, conservation and tourist exploitation of heritage: A case study of a set of subway cellars - Declared an Asset of Cultural Interest (BIC). Art, Individual and Society, 29(1), 163-176. https://doi.org/10.5209/ARIS.52481. https://doi.org/10.5209/ARIS.52481

Borges, B. (2021). Proposta Teórico-metodológica de avaliação dos bens culturais ferroviários. Transportes, Serviços e Telecomunicações - TST, 44, 73-95.

Carvalho Fernandes, E., & Auxiliadora Abranches Monteiro, D. (2019). Análise do Controle Patrimonial de Bens Permanentes em uma Organização Pública. https://www.redalyc.org/articulo.oa?

Castellanos Gutiérrez, Y., Cadena Íñiguez, J., Almeraya Quintero, S., Ramírez López, A., & Figueroa Sandoval, B. (2019). Inventory of heritage resources and inland routes with tourism potential in Pinos, Zacatecas. Mexican Journal of Agricultural Sciences, 22, 15-29.

Conforti, M. E., Giacomasso, M. V., & Endere, M. L. (2021). Heritage regulations and activations. The protection of heritage for its sociocultural sustainability in the Benito Juárez district (Buenos Aires, Argentina). In Revista Pilquen (Vol. 24, Number 4). Centro Universitario Regional Zona Atlántica. http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1851-31232021000400006&lng=es&nrm=iso&tlng=es

García Ríos, C. (2018). TECHNICAL REPORT OF VERIFICATION IN THE SIPCE SYSTEM, AS IN FIELD, OF THE PATRIMONIAL

Received July 27, 2022 / Approved October 02, 2021 Pages: 90-113
eISSN: 2600-5743

PROPERTY (REAL ESTATE) BELONGING TO THE RAILWAY, AND WHICH ARE INVENTORIED IN THE TRAM "ALAUSÍ - BUCAY" - MEMORANDUM No BI-CGR-R3-132-2018.

García Ríos, C. (2019). TECHNICAL REPORT OF VERIFICATION IN THE SIPCE SYSTEM, AS IN FIELD, OF THE PROPERTY PROPERTY (REAL ESTATE) BELONGING TO THE RAILWAY, AND WHICH ARE INVESTED IN THE TRAM "ALAUSÍ - BUCAY" - MEMORANDUM No BI-CGR-R3-095-2019.

Guevara, C. (2018). Geomatics Technical Report - INPCR3-GM-2018-0018.

National Institute of Cultural Heritage. INPC. (2023, May 12). National Institute of Cultural Heritage. The Institute. Frequently asked questions. https://www.patrimoniocultural.gob.ec/preguntas-frecuentes/.

Jaramillo Uribe, G. (2021). New challenges between the official and local discourse of immovable cultural heritage. Territorios, 44, 271-291. https://doi.org/10.12804/REVISTAS.UROSARIO.EDU.CO/TERRITORIOS/A.8033

Lopes Cordeiro, J. M. (2021). Algumas questões sobre o inventário do património industrial ferroviário. Transportes, Serviços e Telecomunicações - TST, 53-61.

Magaz Molina, J. (2021). Methodological contributions for a heritage inventory of the railway legacy as a basis for a territorial system of industrial mining heritage in the regions of El Bierzo and Laciana (León, Spain). Transportes, Servicios y Telecomunicaciones - TST, 44, 152-173.

Motta, L., & Rezende, M. B. (2016). Inventário. Dicionário IPHAN de Patrimônio Cultural. 2. ed. rev. e ampl. In Dicionário IPHAN de Patrimônio Cultural. 2. rev. ed. rev. and ampl. (2nd ed.). http://portal.iphan.gov.br/uploads/ckfinder/arquivos/Inventário%20pdf.pdf

United Nations Educational, Scientific and Cultural Organization. UNESCO (2017). Unesco indicators of culture for development. Methodological manual. www.unesco.org/

Pinassi, A. (2014). Issues surrounding the management of heritage assets. The case of the railway heritage of the town of Sundblad

Received July 27, 2022 / Approved October 02, 2021 Pages: 90-113
eISSN: 2600-5743

(Argentina). Apuntes. Journal of cultural heritage studies, 27(2). https://doi.org/10.11144/javeriana.apc27-2.ptgb

Romero de Oliveira, E. (2021). A ferrovia como problema de estudo multidisciplinar: uma proposta de revisão crítica histórica e estudo do valor patrimonial sobre a ferrovia (São Paulo, Brazil). Transportes, Servicios y Telecomunicaciones - TST, 44, 96-123.

Teixeira, S., & Weissmann-da Silva, M. N. (2022). Inventários Participativos no âmbito do Licenciamento Ambiental: a experiência do PEA Territórios do Petróleo. Revista CS, 37, 145-173. https://doi.org/10.18046/recs.i37.5011

Villarreal Quevedo, F. E., & Rizo Aguilera, L. M. (2023). Recognition of the railway heritage in southeastern Cuba as a form of cultural expression. Theoretical-methodological approaches. ESTOA, 12(23), 125-136. https://doi.org/10.18537/est.v012.n023.a10.

Received July 27, 2022 / Approved October 02, 2021 Pages: 90-113
eISSN: 2600-5743