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Evaluating built environments through a socio-cultural approach. The case of the narrow gauge railway stations, VästraGötaland (Sweden)

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This paper presents an approach for determining factors relating to the knowledge and decision making of a given local built environment in order to understand its evolution. Outlining concepts related with sustainable built development, the research considers evident the pressing problems on specific Historic Built Environments (HBE). Many are the factors that have an influence on the dynamics of HBE but being interested specifically in the study of HBE by appropriation a review on settled paradigms may let us bridging socio-cultural values in a common sphere between people, buildings and landscape. The study attempts to create a common understanding on the occupancy, maintenance, optimization and appearance of built environments providing a selection of indicators to evaluate their status. The research comes to clarify that building use, maintenance or abandon, is not only affected by ecological and economic dimensions, also by social and cultural. The research concludes that it is possible to identify socio-cultural indicators in order to obtain a more coherent dynamics on sustainability and development.

Keywords: Historic Built Environment, Sustainable development, Social Cultural Indicators, Railway Stations, Sweden.

Introduction

The present study is focused on the analysis of dozens of buildings that remain along the historical and now extinct narrow gauge railways landscape of the VästraGötaland region, southern Sweden. Data collection was carried out with extensive fieldwork, in the environments in which buildings are located, by taking notes, photos, and measurements. All the information was collected and processed using digital cartography and other media sources. Data collection shows a fieldwork survey based on approximately eighty-five detached buildings built for a specific purpose in the late 19th century.

The inventory reflected the contemporary situation of the HBE and the direct and indirect consequences stemming from long-term socio-cultural connections to these landscapes, which are affected by their detachment from symbols and signals that originally linked these buildings to their purpose. To evaluate the current situation of the three chosen railways landscape, it was necessary to carry out a specific individual analysis of each building in order to understand direct and indirect reasons linked with use, dereliction and maintenance.

Throughout the 19th century intense efforts were made to improve communication conditions in Sweden (Bodstedt, 1945). When therailroads emerged in 1850 as a feasible alternativeto canals and other waterway projects, there was extensive debateaboutthe pros and consof each type of communication. Most parishes were in favor of railroads and wished to see some built crossing their own land, but designs responded mainly to the geographical location of the specific parish (Johansson & Mårtensson,1979). Most of these railway lines were built around 1850, coinciding with the greatest expansion of this means of transport (Linde, 1989).

The birth of the railway also helped farmers to develop their settlements, providing schools and other services which had been non-existent until then. This benefitedagricultureas the population was no longer divided and couldengage infarmmanagement. Besides, the development of industry in the province was specifically supported by private companies looking for international commerce (Forsæus, 1985).

Many buildings in the countryside, such as the stations for the narrow gauge railways, were influenced by publications of architect Adolf Edelsvärdand the farmbuilderCharlesEmilLöfvenskjölds(Linn, 1986). Architects wanted to adapt buildings to the surrounding natural environments (Wetterberg, 2012). Influenced by contemporary English literature they were attracted by the emerging picturesque villa style (Linde, 1986).

Built environments valuation

Current research analyzes specific built environments as fragments of regional infrastructures which technological and economic development caused to become detached from their original purpose and specific functions. Most of these buildings have undergone important transformations, while others have been abandoned. The inflexion point is fully dependent on the understanding of how socio-cultural implications and decision making can affect the equilibrium between the historical legacy, its materiality, its representation and the necessary changes forced by time and development (Fig. 1).

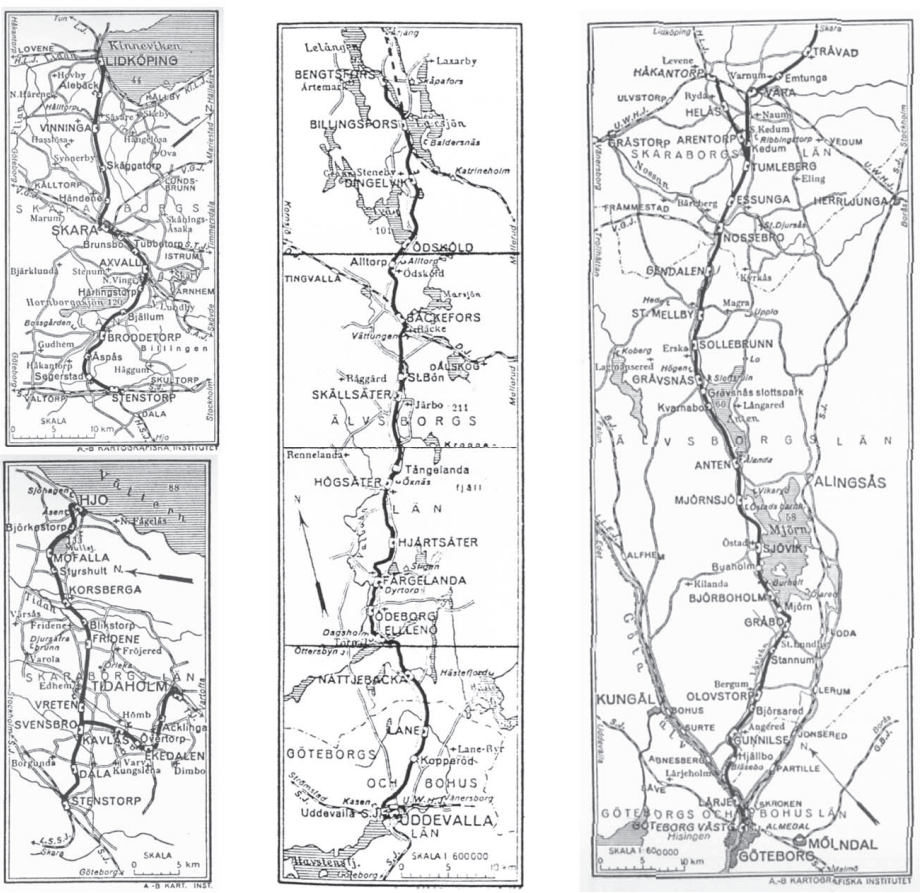

Figure 1. Narrow gauge railway lines (891mm) from VästräGötalandThe first studied connected Lidköping-Stenstorp (LSSJ) and Hjo-Stentorp (HSJ) on November 13th, 1873. On July 31st, 1885 the second railway, connected Udevalla with Lelångens (ULB), while the last one, the Västergötland-Göteborg railway, opened to the public on January 1st 1900.

The relationship between cultural values and built environments' sustainability has been presented through diversity and the property needs of future generations to be understood as part of the process. Lately, these terms have been adopted as relating to tangible and intangible values; direct and indirect consequences of the history of the place that play a part in the current situation. Throughout their history, all buildings have improved their conditions in accordance with requirements of comfort(Andersson&Sjomar, 1984). But adaptations linked with access to materials and technology, were slowly changing the way these buildings were built (Figs. 2 and3).

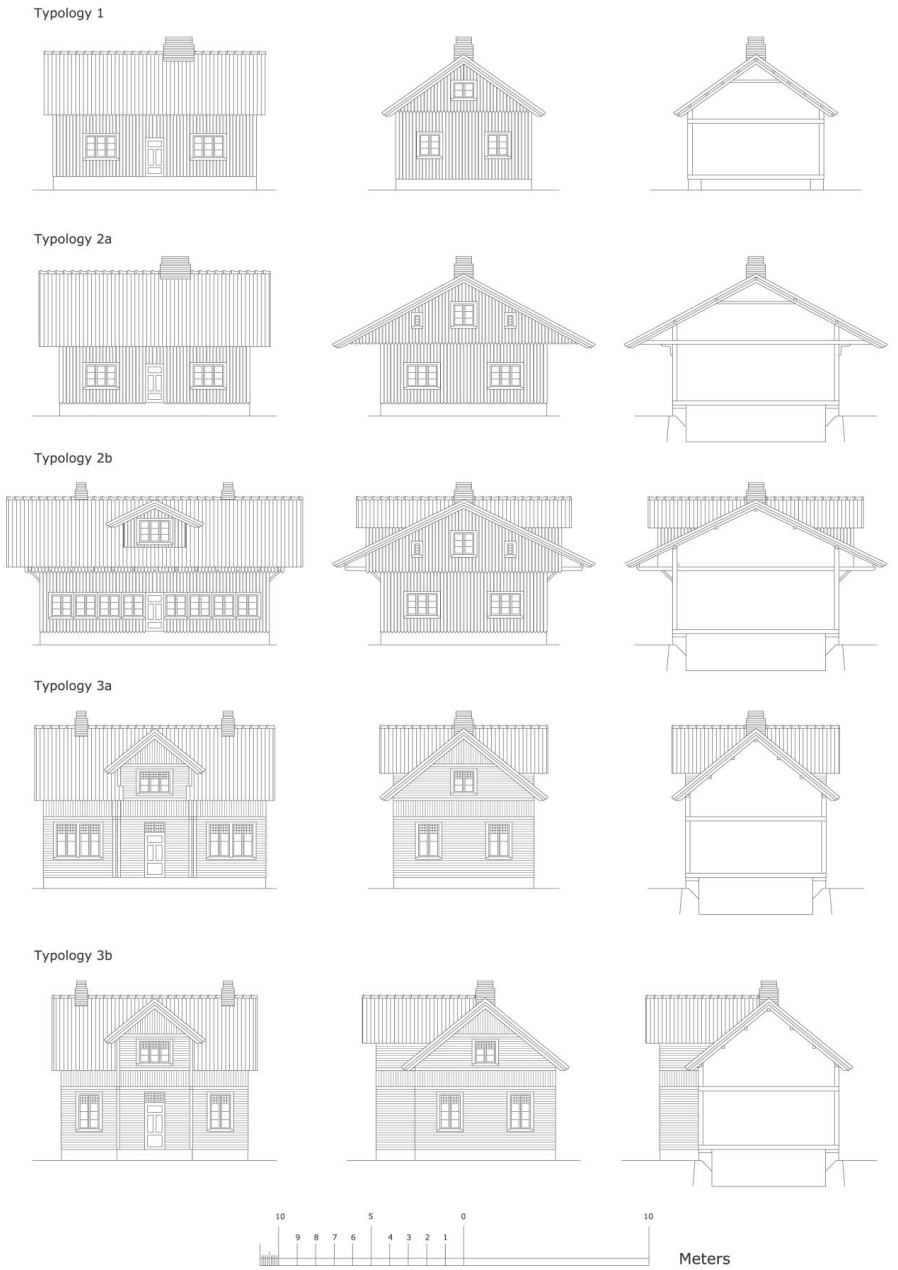

Figure 2. The different models of railway stations surveyed on the three railways studied.

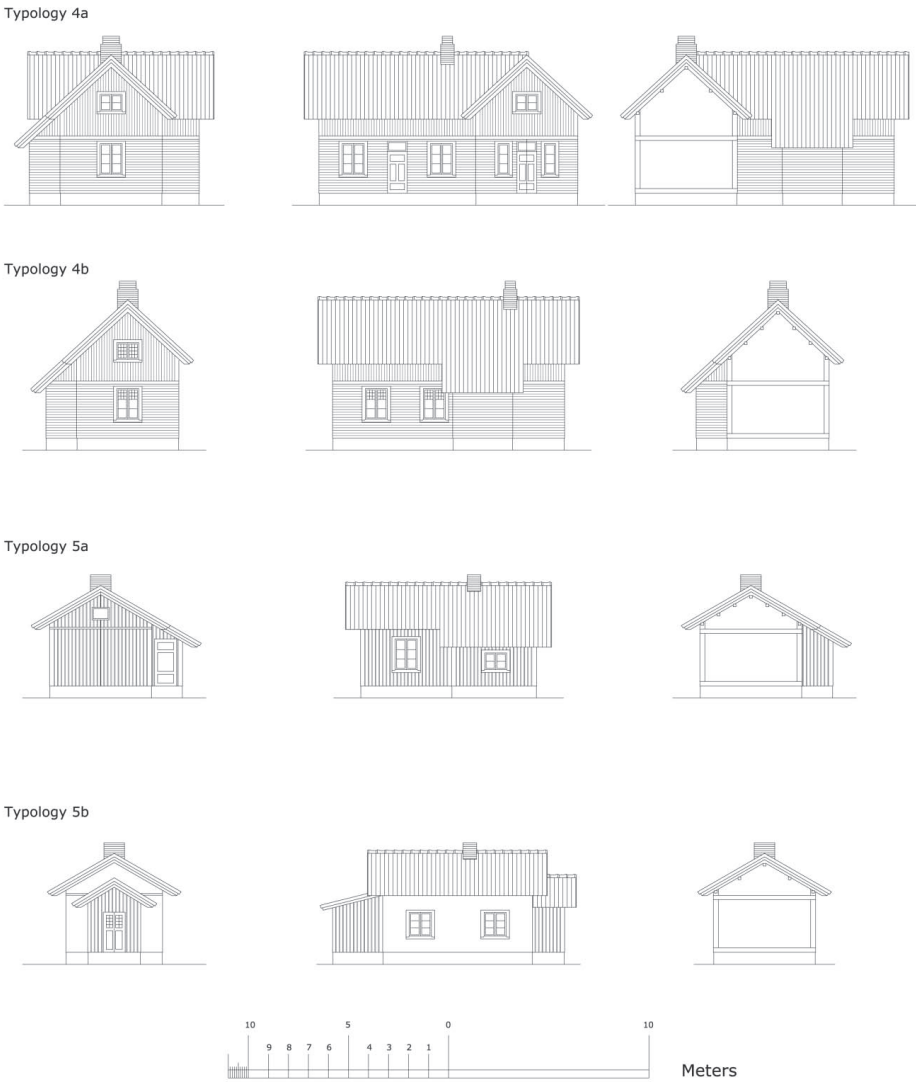

Figure 3. The different guard cabins found in an average separation of 3kilometres ofrailway, detached from urban settings to control rural junctions and the maintenance of the associated railway stretch.

The socio-cultural evolution of each country, the existence of centers of knowledge, political decisions, laws, and other forms of decision making are indirectly related to long-term processes that affect the way they understand the physical deterioration of their buildings, theirmaintenance and their repairs. In this respect, each environment is indirectly affected by the transformations of its buildings (Jönsson, 1992).Thus, preservation should be synonymous of not forgetting, something which is mostly related with aesthetic perceptions –culture and knowledge- and not only transmitted by an amount of dislocated buildings. Today, second generations live and reenact the landscape which was the stage for the sensations and desires of their ancestors' lifestyle. Although this lifestyle has now gone, some descendants are still able to recall places which were orally transmitted.

Lately, experts who have been particularly close to terms linked with iconographic conservation have stated that some locations with outstanding universal values (Pereira & van Oers, 2012) have suffered as a result of the growing tension between globalization and local development. In a substantial number of places this has provoked incompatible new development in historical settings, unsustainable tourism, and overall environmental degradation, all of which cause new challenges to urban heritage

conservation and its management (van Oers & Pereira, 2012). In addition to this, recent recommendations have promoted new ways to include various different aspects of conservation in an integrated framework in the hope of reaching consensus, assessing and integrating vulnerabilities, prioritizing actions or establishing suitable partnerships (Bandarin & van Oers, R. 2012).

Understanding the management of built places as a complex entity far removed from previous conventions, based on "external" challenges regarding objects, people and places that are culturally, intellectually, and economically less developed, can provide us with an insightful understanding of occupancy, maintenance, transformations, transmigrations and popular art of specific environments (García-Esparza, 2012) (Fig. 4).

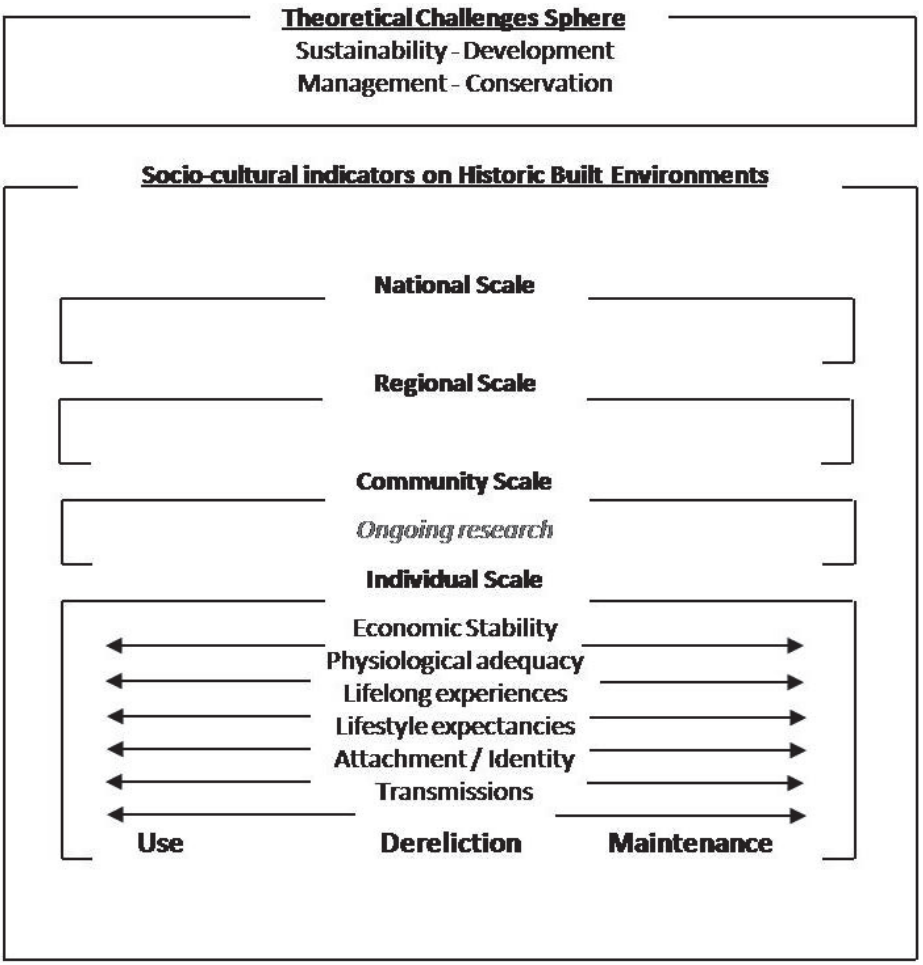

Figure 4. Scheme of the Socio-cultural indicators on historic built environments.

Methodology

The aim of this paper is to present new and specific approaches for demonstrating empirical evidences, highlighted by personal, social and cultural meanings, on the dynamics of specific HBE. Following terms of social and cultural capital (Colantonio, 2007), while social relates the interaction of an individual in a society and cultural is related to the interaction of groups of people with objects and structures (Mikusínski et al., 2013), the study will analyze the interaction between the individual and the building.

System performance indicators are exposed to provide information about the equilibrium between individuals and buildings (Innes & Booher, 2000). The measurement of HBE factors is an empirical

assessment to assure that such indicators can be influential and can contribute to its sustainability. Our framework is firmly grounded in the theoretical approach (Innes, 1990) by analysing social and cultural affections on given HBE. Several studies have analysed the importance of indicators of social values for economic development (Knack & Keefer, 1997), environment (CSTB, 2001), human health (Grahn & Stigsdotter, 2010), urban and regional planning (Wong, 2006), urban historical areas (Elsorady, 2012), rural development (Van der Ploeg et al., 2000), communities (Phillips, 2005) and landscape (Bouwen & Taillieu, 2004).

The data compilation started by elaborating a database where buildings' features and owners' comments were related with pre-established indicators. The information extracted from each building visited along the cataloguing work was stored. Once allbuildings were analyzed the evaluation process began. According to the importance of the features and the owners' concerns expressed on each building, data were associated with the correspondent indicator depending on a three levels scale: Low, Middle and High. The qualitative exposed methodology is descriptively analyzed when explaining the results and discussion.

The set of chosen buildings to undertaking the indicators evaluation belongs to an inventory developed in Sweden in 2012. Buildings are associated to three narrow gauge railways in VästraGötaland originals from the end of the 19th Century. The reason of analysing the materiality and the landscape surrounding specific buildings is founded in understanding HBE long term process affected by individuals' decision making.Nevertheless, to attempt a specific analysis of the obsolescence process (Mohr & Schmidt, 1997) given by the evident consequences of interactions, it cannot be effective without being evaluated under potential indicators (Fig. 5).

	BUILDING USE	**References:** **(Pereira, & van Oers, 2012), (García-Esparza, 2013).**
8.1	**Economic Stability**	**The individual is intended to remaining in the building**
8.2	**Physiological adequacy**	**The building fits with a desired physiological adequacy**
	BUILDING DERELICTION	**References: (Martínez-Fernandez et al., 2012), (Isaksen & Karlsen, 2013).**
9.1	**Lifelong experiences**	**Forms of inadequacy, pathologies or other misfits**
9.2	**Lifestyle expectancies**	**Abandon because of necessity or life option**
	BUILDING MAINTENANCE	**References:** **(Doratli, 2005), (Gallent et al., 2011).**
10.1	**Attachment / Identity**	**Capacity of maintaining the character of the building**
10.2	**Transmissions**	**Culture: individual's experiences and transmissions**

Figure 5. Building use.

The research project has considered establishing three levels of indicators affecting the process of obsolescence in buildings: the use, the dereliction and the maintenance. The first indicator, the building use, is normally affected by owners' stability, if the individual or family is intended to remaining in the place in the future and in same terms if the building fits with their desired physiological adequacy, changes and adaptations. The second factor, the abandon, is normally forced by other forms of inadequacy, pathologies, insalubrities or third affections coming from what the owner understand as building's misfit on the contemporary immediacies.

On this factor, it also must be considered in which extent each individual considers its abandon because the necessity of mobility or because other options of life. The third factor, the maintenance, is related with the adequacy of the building. Independently of the choice of the owner, how the capacity of maintaining the character of the place is reflected in the building. Thus, this factor is directly affected by individual's knowledge and its capacity to respectfully adequate the shape of the building to the necessary changes. This factor is directly affected by the transmission of the culture, individual's experiences, centres of knowledge and even legislation if existent.

Results and discussion

The inventory, assessed by extensive field work, was aimed to analyse the situation of obsolescence of 83 buildings never catalogued before. The research found that the 44,58% of them no longer existed. For the rest of the buildings, 55,42%, indicators show that the 14,46% of the buildings are seriously threaten because of the abandon, or the intention of, a temporary use but with harsh deteriorations or a lack of

maintenance and repair. The stay of decay of the building does not ensure its survival for future inhabitants or the level of transformation has completely deleted any sign or remembrance of the past. The 24,09% of the buildings manifest similar dimensions and features from the traditional craftsmanship that characterized the specific typology of each building. Thus, they are inhabited and present respectful changes and good conditions to be passed through next generations. The 16,87% are used, adapted and maintained in really good conditions of conservancy. Thus, their conservation level ensures from then on its existence with respectful adaptations because of the socio-cultural awareness, locals' transmissions and nearby centres of knowledge.

From the 14,46% of abandoned buildings the catalogue found, the 10,84%, are severely transformed or rebuilt because of pathologies or insalubrities. This percentage is related with buildings that showhigh levels of economic stability along generations due to their permanent occupation. The kind of transformations shows low rates of adequacy to contemporary functions. The transformations indicate the existence of severe pathologies along their history, some of them still manifested it, and thus, high levels of insalubrities or inadequacy could be the reason of such transformations. The previously said perhaps is related with high indices of uncomfortable experiences;nonetheless the option of living there remainedhighlyvaluated by their owners due to its contemporary feasibility.

The other 3,62% have completely disappeared or what remains is a neo interpretation of what the building was. The previous comments can also be applied here. But in these cases there is a manifested historical breakage between the owners and the building. The differences with the previous case are low levels of economic stability of their owners. In some of the analyzed cases their location, far from the nearest villages or directly affected by pressures of new developments, could affect the exposed dynamics. In both cases, a low sense of identity or attachment is manifested. These cases also represent low levels of transmissions, cultural training or knowledge referred to maintaining certain features. Nonetheless some other reasons related with the age of the owners shouldn't be disregarded.

From the 24,09% of the buildings still in use, those that have high indices of use, 10,84%, have demonstrated high levels of physiological adequacy, a sustained or maybe good rates of economic stability, low rates of pathologies and insalubrities and furthermore low expectancies of owners moving elsewhere; it means that contemporary lifestyle is well adapted to the building and the environment. As regards as the level of maintenance they show good or high levels of physical features maintenance, what could be the indicator of high engagement with nearby communities, the identity or attachment to the place or even high levels of local culture knowledge and transmissions.

The other 13,25% are used as a secondary house. The survey relates low levels of economic stability from previous generations buthigh expectancies from current ones of moving elsewhere; in spite of said a few pathologies are manifested. Low levels of knowledge and transmissions are expressed in terms of small actions of refurbishment by which some parts of the building or important features associated to the original shape were sensitively transformed or lost. Nonetheless, in some extent the building and their owners manifest high levels of attachment or identity with the place.

From the 16,87% of buildings classified in this section,a 9,64% are probably related with high historical stability in economic terms. Buildings that never changed their usage or highly fitted with new commends in the different epochs. Then, these are buildings which manifest low rates of pathologies or no important misfits but a doubtful background on their owners' stability. Today, the ownership of the buildings is mostly public; maybe it has been along their history and because of that, their higher level of material conservation and original expression could be explained. But, in spite of said, the other 7,23% were leased at some stage of their history. Today, they highly express their historical background although they manifest high levels of contemporary inadequacy because of their location, access or other infrastructures that affect them; thus, they are highly exposed to arising critical pathologies. Nonetheless, in both cases, the high levels of maintenance are ensuring their survival just because of the high levels of sensitivity and knowledge from nearby communities (Mannarini et al., 2006).

Conclusions

As regards as the relation between buildings and individuals analyzed in the case study, the research has found a direct relation between Lifelong experiences, the Economical Stability and Lifestyle Expectancies as directly connected with Historical Abandon and Significant Transformations. Some other buildings have shown clear relations between Attachment, Transmissions and Lifestyle Expectancy determining in which extent contemporary buildings that today maintain a specific use are highly or lower maintained in terms of physical conservancy. Finally, the study has found a clear correspondence between indicators of Economical Stability, Physiological Adequacy and Lifelong Experiences to explaining differences between use and abandon in buildings with high standards of maintenance.

The researchdemonstrates that it is possible to identify indicators and match them with verifier variables to support inclusion of social and cultural values on HBE dynamics. There is, however, more work to do because a clear disconnection is manifested in the assessed realities. Traditional settings, places and landscapes are constantly changing. Although it is widely accepted, the implications the rhythm and forms of change bring with them are not. The research has demonstrated how individual's perceptions and physical features may affect the integrity of a given environment. Empirical research that explicitly

investigates these links in specific case studies is still uncommon. Thus, the qualitative data processing employed to evaluate the scale of indicators is intended to develop ties with a future quantitative research.

Further research on HBE indicators should analyze in which extent relationships between communities and historic environments can affect their sustainability. There is an ongoing study in which the author of this paper has focused his interest on these interactions at Local or Community level by analyzing and comparing different realities. According to pre-established indicators measured levels of attitude-behaviour could be assessed by relating places, spaces and objects with societal meanings.

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