

Identification of Indicators for Sustainability of Cultural Heritage

Hari Gopal Shrestha ^a, Sangeeta Singh ^b, Ashim Ratna Bajracharya ^c

a, b, c *Department of Architecture, Pulchowk Campus, IOE, Tribhuvan University, Nepal*

✉ ^a shresthaharig@gmail.com, ^b sangeeta@ioe.edu.np, ^c ashim.bajracharya@pcampus.edu.np

Abstract

Cultural heritage is a shared good that is left as a legacy from one generation to the next. Specifically, heritage has a vital function as a non-renewable resource that cities depend on, essential to their character, and the driving force behind their vibrancy as hubs of economic development. Heritage may significantly contribute to the goals of social, economic, and environmental sustainability. In many nations, UNESCO and its partners have been successful in developing public understanding about how culture can contribute to sustainable development and how unsustainable development can have a negative impact on culture. Many criteria are necessary for a comprehensive assessment of sustainability of specific instances in heritage value-based management. Sustainability indicators are already evolving from key performance indicators (KPIs) that demonstrate the level of compliance and serve as a tool for observation. Each indicator created provides for the examination of a system's characteristic in both qualitative and quantitative ways that is motivated towards sustainability. They are organized into separate lists that account for all stakeholder interests and enable monitoring of how well those expectations have been met. Outcomes are not assured by sustainability indicators, but outcomes are not even possible in the absence of indicators. Sustainability indicators are the most important uses for planning and monitoring. This article aimed to find some of essential indicators to manage cultural heritage on sustainable manner through reviewing several articles related with indicators of Sustainable conservation of cultural heritage, sustainable development of cultural heritage, and Sustainable management of Cultural Heritage that are ultimately necessary for the sustainability of the cultural heritage. This paper has followed the process of the explanatory research design with constructivism paradigm. Through the study of different research articles that are peer reviewed on several other articles regarding sustainability indicators, thirty three sustainability indicators have been identified that must be useful in the case of Nepal's cultural heritage. Finally fourteen sustainability indicators have been constructed on the basis of above selection and further study about relation between these indicators and cultural heritage sites. The findings are based on interpretation of necessity of our own cases and are based on qualitative analysis.

Keywords

Cultural Heritage, Sustainable Development, Sustainability Indicators

1. Introduction

Cultural heritage is a shared benefit that is passed down from one generation to the next as a legacy. Specifically, heritage serves as a "critical role as a non-renewable resource that is an essential component of cities, essential to their identity, and driving force behind their vibrancy as centers of economic development [1]." As it is agreed, the mistaken disregard of the significant social and economic measures of heritage has frequently resulted in the irreversible decay and destruction of heritage assets, sustainability has excessive prospective to bring heritage conservation and tourism as well as economic development into a stable and productive connection [2]. It is vital to describe, while creating a list of sustainability indicators, which features of sustainability in the current idea should be monitored, which earlier unconsidered attributes should be added, and how should these attributes relate to each other [3].

1.1 Cultural Heritage

The Venice Charter for the Conservation and Restoration of Monuments and Sites (1964)'s first article recognizes that a historic monument includes not just one architectural piece but also the urban or rural environment that contains artifacts from an important historical development, a historic event, or

the remnants of a specific civilization. This is true not just of amazing job of art but also of earlier, extra humble creations that have grown in cultural significance over time [4]. The European Commission (2015) claims that preserving cultural assets in urban settings has "improved quality of life and reduced carbon emissions." Both Tweed and Sutherland (2007) and Bandarin and Van Oers (2012) have highlighted its economic and social benefits, paying particular focus to its intangible elements and community involvement [5].

Two viewpoints can be used to identify cultural heritage. The first one is a foreign idea, whereas the second is a local idea. These viewpoints offer various insights on the conventional philosophy and contemporary idea of cultural heritage. A global viewpoint gives a methodical approach to identifying and verifying cultural significance as well as to advancing the process broadly. Through the incorporation of local philosophy into people's daily lives, local viewpoint offers the possibility of creating a good society [6].

In many nations, UNESCO and its partners have been successful in raising public awareness of the harmful effects that unsustainable development can have on culture as well as in presenting verifiable proof that culture has the ability to support sustainable development [7].

1.2 Sustainability and Sustainable Development

A society is deemed sustainable if it has achieved sustainability through the process of sustainable development [8]. Sustainable development is considered as a paradigm for anticipating the future, where social, economic and environmental factors are balanced in an attempt to raise the standard of living for people [9, 3]. Simultaneously, the development itself bears witness to a particular energetic manner. The state of the system and its broad aim vision are referred to as "sustainability" [10, 3].

The phrase "sustainable development" gained popularity, after the Brundtland Commission's "Our Common Future" report was released [11, 3]. According to the report, sustainable development is "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" [12, 3].

The three interwoven pillars of sustainability, which include social, economic and environmental considerations, are the most frequent way to define it [13, 3]. In academic writing, the sustainability model is frequently represented by three intersecting circles: society, economics and environment. Sustainability is placed at the junction of these spheres [14, 3].



Figure 1: The overlapping circles model of sustainable development

The features of the understanding and method to sustainability assessment vary based on the level of economic activity that the object of evaluation is situated within. The following levels of sustainable development should be recognized, according to the Schukina L.V. study [3]:

- International (Global)
- National
- Regional
- Sectorial
- Corporate

Sustainable development is a dynamic idea that has changed over time, becoming more of a holistic idea as a result of the input from international discussions and gatherings, although initially it was primarily focused on its environmental aspect. In this context, it is acknowledged that legacy, heritage, which

has long been marginalized in the discussion of sustainable development, may make a significant contribution to the objectives of social, economic, and environmental sustainability [15, 5].

1.3 Parameters, dimensions and Sustainability indicators of cultural heritage

The expression "we are concerned about what we are measuring" parallels the idea that "we measure what we are concerned about" in forming that value [16, 3]. Each indicator that has been produced enables the quantitative or qualitative assessment of a particular attribute of a system that is working toward sustainability. They are compiled into distinct lists that reflect all interests of stakeholders and allow for the measurement of the fulfillment of those expectations [3]. According to Wu and Wu, quantitative indicators help to define sustainable development, increase understanding of the intricate practical relationships between sustainability's various components, and advance the science and practice of sustainable development [17, 3].

Indicators are measurements of the existence or severity of existing difficulties, warning signs of impending circumstances or complications, gauges of danger and possible requisite for action, and tools for identifying and measuring the outcomes of our arrangements. Indicators are data sets that have been deliberately chosen to be utilized on a steady basis to track variations that are important for managing and development [4]. By streamlining, defining, and providing policymakers with aggregated data, they can assist in integrating knowledge from the physical and social sciences into decision-making as well as in measuring and gauging progress toward the Sustainable Development Goals [18].

"Results are not guaranteed by sustainability indicators, but results are not possible without the use of indicators," [16, 3]. This claim highlights the third crucial use of sustainability indicators, which is for planning and monitoring (Figure 2).

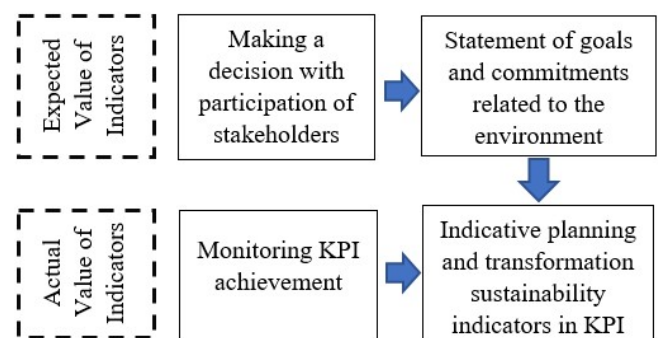


Figure 2: The importance of sustainability indicators in managing stakeholder expectations

(Source:Cherepovitsyn, A., Euseeva, O. (2020) [3])

The commitment to execute sustainable development practices for the environment is displayed in the illustration (Figure 2) by the specified measured outcomes of sustainable development that serve stakeholders' interests. Key

performance indicators (KPIs) that show the level of guarantee to submission and serve as a tool for monitoring are already becoming sustainability indicators.

Hundreds of indicator and index lists define the quantity of instruments for assessing sustainability that are created and used today on a global and local level. Some of them call for an integrated assessment, while others are geared at evaluating certain aspects of sustainable development [19, 3].

International organizations' lists of sustainability indicators are the most well-known and regularly cited listings. They include the Organization for Economic Co-operation and Development (OECD), the International Institute for Sustainable Development (IISD), the United Nations Commission on Sustainable Development (CSD), the European Environmental Agency, the World Bank, and the Institute for European Environmental Policy, which are primarily focused on evaluating sustainable development at the national and international levels. The evaluation of sustainable development at the micro level is carried out by groups like Global 100, S and P Global, the Global Reporting Initiative (GRI), and the Russian Union of Industrialists and Entrepreneurs (RSPP). There isn't yet a single, widely used method to evaluate sustainability [3].

The goal of the indicator set heavily influences how the indicators are chosen. The indicators should be both concise and thorough enough to reflect the multifaceted character of sustainable development. The results become cumbersome and challenging to comprehend when too many indicators are employed [18].

Using the Brundtland definition as a comparison, sustainable management of heritage assets is concerned with how we may maximize the gratitude of our history in a manner that will ensure its continued relevance in the future [12, 20]. Although the Brundtland description initially begins with holistic sustainability, in recent years the emphasis has switched to the Planet pillar due to the inclusion of climate change and energy efficiency in planning processes. When compared to climatic issues, social and economic sustainability are perceived by most policymakers as fuzzy, difficult-to-communicate notions [20]. David Throsby notes that in order to address the issues with environmental technology evaluation methods, a comprehensive, interdisciplinary review process is required [21, 20]; for instance, societal factors also matter since they have a direct impact on how well architectural heritage is kept [20].

Lessons learned from the Mexican case study indicate that an ad hoc prioritization of development factors poses a problem for the world heritage city's ability to sustainably develop. This leads to a partiality in the operationalization of plans in favor of policymakers' interests in the city's economic competitiveness. The research on urban elements impacting the conservation of a World Heritage property revealed the relevance of often employed indexes intended to evaluate the case study's progress [22]. The announcement of the European Framework for Action, which encourages and implements an integrated and participative approach to cultural heritage and helps mainstream cultural heritage throughout EU policy [23].

Numerous techniques and tools have been created in the field of urban planning to assess the sustainability of the built environment, each with a unique viewpoint, strategy, or objective. All of these urban planning methods, sadly, are not tailored to the unique qualities of a heritage property, making them inappropriate for heritage conservation. The best-case scenario is that legacy features are given little consideration beyond being one indicator or sub-indicator. In heritage value-based management, many factors that are crucial for an integrated sustainability evaluation of particular cases, such as cultural heritage assets, are blatantly ignored. According to Avrami, the heritage field is faced with the requirement to qualify and quantify its basic contributions to society and sustainability now more than ever before. The field must convincingly show how it enhances community quality of life, whether through environmental, economic, or social benefits. An essential first step is to reorient heritage conservation's objectives so that they support sustainability as a whole [24, 20].

2. Objective

The main objective of this study is to explain some of the essential sustainability indicators of cultural heritage that will be useful for the preservation, protection, utilization, and management of cultural heritage in Nepal.

3. Methodology

3.1 Research Design

This research is explanatory and tries to explain the knowledge obtained. The research problem is social and subjective, and knowledge has been constructed through a literature review of similar cases.

3.2 Research Paradigm

This research is based on the constructivism research paradigm. The knowledge about sustainability indicators of cultural heritage towns in Nepal is constructed through the past experiences of similar cultural heritage urban centers in foreign countries.

3.3 Research Strategy

This research is qualitative in nature, although there are few numerical data and looks like it is quantitative. The findings are not dependent on numerical values but rather on the necessity of our own case.

3.4 Research Method

The method of this paper is a literature review. We carried out an analysis in three steps. Initially, we found four study papers utilizing computer-based search engines that reviewed several other papers focused on sustainability indicators for heritage buildings, to bridge sustainability and urban heritage conservation, and for the planning and management of cultural heritage. The chosen publications offer metrics or

standards for evaluating how sustainable cultural heritage is. Those four studies are presented in Table 1.

Table 1: List of the 4 Studies

SN	References	No. of papers reviewed	No. of Indicators
1	Liusman, et al. (2013) [25]	NA	17
2	Sowińska-Świerkosz (2017) [26]	48	8
3	Tanguay, et al. (2014) [27]	25	20
4	Guzman (2020) [22]	NA	36

Second, the indicators utilized in these investigations were retrieved. We examined their qualities, including quantity, usage frequency, and nature. Such an analysis is crucial to determining the shared traits of the suggested indicators, particularly if one is choosing core key indicators.

Third, the important indicators were found in three different dimensions of sustainability, i.e., environmental, social, and economic, by using selection criteria for systematic coverage of the primary justifications for managing Nepal’s cultural heritage sustainably.

4. Overview of Indicators of Sustainable Development of Heritage Towns

Liusman, et al. (2013) have developed a set of indicators called the Heritage Sustainability Index (HIS), consisting of environmental, social, and economic dimensions. A total of 17

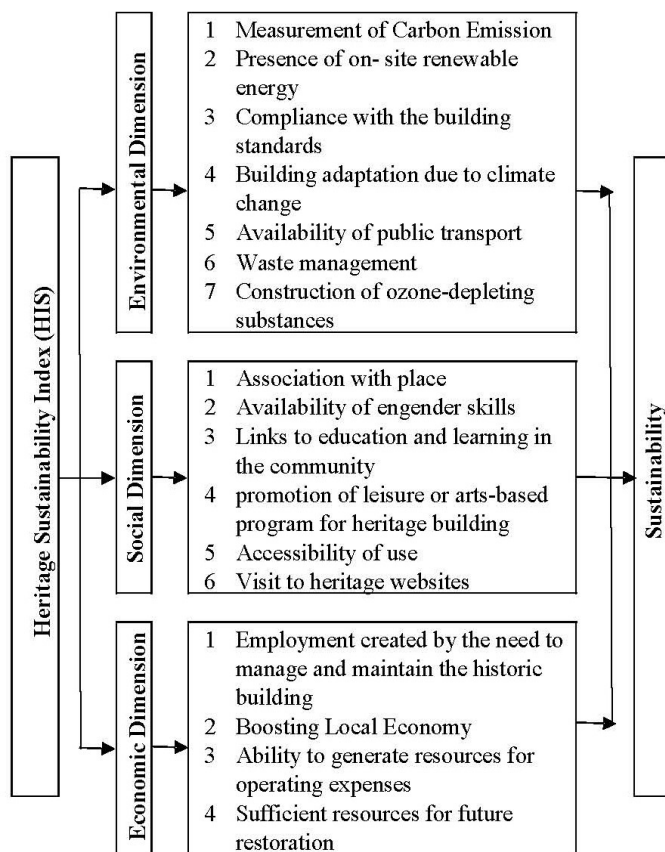


Figure 3: Framework of Heritage Sustainability Index (HIS) for Heritage Buildings (Source: Liusman et al. (2013) [25])

indicators were selected to assess the level of heritage building sustainability [25].

Sowińska-Świerkosz (2017) has selected the 8 most suitable indicators for planning and managing cultural landscapes by analyzing recent studies (48 papers), which denote the expansion and operation of cultural heritage indicators (CHI) [26].

1. Architectonic Quality: Preservation of facades
2. Ecological quality: improving urban greenery; - The presence of historic fruit and habitat trees
3. Economic significance: Funding for community arts projects and the necessary investments for cultural property preservation
4. Perception aspect: The area or percentage of places that are spiritual or religious
5. Value of political activities: Landscape management's effectiveness and a plan that preserves the historical and natural environments
6. Social care: percentage of individuals engaging in customary or cultural activities
7. Spatial superiority: Historical buildings and Monuments
8. Visual quality: The quantity and clarity of unsettling objects and elements, aspects of the cultural landscape that are visible

Tanguay, et al. (2014) have presented an overview of the literature, which indicates a lack of agreement on the right metrics and methods to apply when evaluating the sustainability of urban heritage preservation [27]. They analyzed 25 case studies that particularly address and suggest indicators for the preservation of sustainable urban history.

Guzman (2020) discovered a total of 36 indicators that appeared frequently in the investigated frameworks, ranging from 4 to 3 times (Table 3). Using Querétaro city, Mexico, as the case study, this research sought to identify common indicators to track relationships between development drivers and cultural conservation. The Sustainable Development Goals (SDGs) on urban development (SDG11) and climate change (SDG13) were the focus of this study. These objectives place a strong emphasis on the necessity of suitable operational tools for tracking improvement and representing a junction for consistency through different but related tactical domains that expressly take into account natural and cultural assets [22].

Table 2: Key Indicators of Sustainable Urban Heritage Conservation

Indicators	Covered Dimension	Threshold
Characterization		
Attachment to place	Social	5
Traditional value or perceived	Social-Econ.	5
Artistic, aesthetical and harmonious value or perceived	Social-Econ.	6
Building fabrics, insulation and ability to adapt	Soc-Econ-Env.	5
Protection		
Viability of recycling existing materials	Econ.-Env.	4
Authenticity	Social-Econ.	7
Integrity	Social-Econ.	6
Spatial compatibility	Social-Econ.-Env.	5
Enhancement		
Environmental and ecological awareness	Env.	5
Promotion of actions for further knowledge of historical-cultural heritage	Social-Econ.	2
Improvement of living conditions and quality of life	Soc-Econ.-Env.	5
Benefit of reuse versus redevelopment	Soc-Econ.-Env.	3
Use and Impacts		
Locals and visitors interests and involvement to conservation	Social	4
Business and functional use	Econ.	3
Investments and tourists drawing	Econ.	2
Increase urban density	Soc-Econ.-Env.	2
Policy and regulations		
Public perceived consideration of their opinion	Social	3
Adequate protection and management system	Social-Econ.	4
Compliance with regulations and building codes	Social-Econ.	4
Stakeholders inclusiveness and partnership	Soc-Econ.-Env.	2

Source: Tanguay, et al. (2014) [27]

5. Analysis

The indicators from different four literature were listed in accordingly seven different dimensions (Table 4). Total seventy indicators were counted. As shown in table 4 below, maximum 33 indicators were under the social-economic (Equitable) dimension. Similarly Social dimension is on the second highest position with thirteen indicators and Sustainable dimension is on third position with 10 indicators.

It is very hard to find repeated indicators. Only one indicator “Association with Place” could be found as repeated. All of these seventy sustainability indicators have their own importance but, among them, here has been listed only 33

Table 3: List of frequently used local indicators.

SN	Indicator	Dimension
1	Urban Size	Sustainable
2	Protected Areas	Environmental
3	% of Green Areas – Recreational Parks	Livable
4	No. of Public Libraries	Equitable
5	No. of Theatres and Music Halls	Equitable
6	Festivals and Religious Parties	Social
7	No. of Museums	Social
8	Road Network	Equitable
9	Population Density	Equitable
10	Literacy Rate	Equitable
11	Air Pollution	Livable
12	Accessibility (River Area)	Livable
13	Housing	Equitable
14	Deterioration phenomena (built environment)	Equitable
15	Marginalization Rate (Low)	Equitable
16	Community Involvement in Decision-Making Processes	Social
17	Population with Access to Healthcare	Equitable
18	Research and Development	Equitable
19	Financial Organization	Economic
20	No. of Police	Equitable
21	Natural Risk	Sustainable
22	No. of Automobiles – Road Traffic	Sustainable
23	Crime Level (Robbery)	Equitable
24	New Constructions/% of New Buildings (On Virgin Land)	Equitable
25	No. of Schools	Equitable
26	No. of Markets	Equitable
27	Productive Sectors (agricultural, industrial and services)	Equitable
28	Recreational-Sport Areas	Equitable
29	Electricity (Light Infrastructure)	Equitable
30	Water Supply	Sustainable
31	Telephone (Access, Visual Disruption)	Equitable
32	Investment for Intervention	Equitable
33	Modes of Transport	Equitable
34	Access to Sewage System	Equitable
35	Population with University Degree	Equitable
36	No. of Hotels	Equitable

Source: Guzman (2020) [22]

sustainability indicators that may be suitable for Nepalese cultural heritage.

Table 4: List of Indicators found in literatures in different dimensions

SN	Dimensions	Indicators Count
A	Environmental Dimension	9
B	Social Dimension	13
C	Economic Dimension	7
D	Social-Economic (Equitable)	33
E	Economic-Environmental (Viable)	1
F	Social- Environmental (Livable)	7
G	Social-Economic- Environmental (Sustainable)	10

Table 5: Selection of Suitable Sustainability Indicators for cultural Heritage in Nepal

SN	Indicators
A. Environmental Dimension	
1	Availability of public transport
2	Waste management
B. Social Dimension	
1	Association with place
2	Availability of engender skills
3	Visit to heritage websites
4	Festivals and Religious Parties
5	Locals and visitors interests and involvement to conservation
6	Community Involvement in Decision-Making Processes
7	Percentage of people participating in traditional/cultural activities
8	Monuments and historical buildings
C. Economic Dimension	
1	Employment created by the need to manage and maintain the historic building
2	Boosting Local Economy
3	Ability to generate resources for operating expenses
4	Sufficient resources for future restoration
5	Business and functional use
6	Investments and tourists drawing
D. Social-Economic (Equitable)	
1	Traditional value or perceived
2	Artistic, aesthetical and harmonious value or perceived
3	Authenticity
4	Integrity
5	Promotion of actions for further knowledge of historical-cultural heritage
6	Adequate protection and management system
7	Compliance with regulations and building codes
8	Road Network
9	Deterioration phenomena (built environment)
10	No. of Police
SN	Indicators
D. Social-Economic (Equitable) (Contd...)	
11	Crime Level (Robbery)
12	Access to Sewage System
13	No. of Hotels Building facades for tourists
14	Conservation of Traditional
15	Investments required for restoration of cultural property, Community arts funding
E. Social-Economic- Environmental (Sustainable)	
1	Improvement of living conditions and quality of life
2	Stakeholders inclusiveness and partnership

6. Findings and Discussion

From above analysis and selection of the indicators, we have constructed new list of sustainability indicators that must be importance in the case of cultural heritage in Nepal.

1. **Monuments and historical buildings:** Retaining historic

buildings and improving them to suit modern rules and requirements can be economically beneficial [28].

2. **Festivals and Religious Parties:** Festivals and Religious Parties are intangible cultural heritage of the traditional urban centers. Tourists are interested in learning about other cultures and experiencing the diversity of performing arts, handicrafts, traditions, and cuisines around the world [29].
3. **Conservation works:** Cultural, aesthetic, educational, environmental, social, historical, and other values contribute to heritage conservation. The economic importance of heritage preservation is a fairly recent addition to this list of values [30].
4. **Tourism Activities:** Tourism plays a critical role in ensuring the financial viability of heritage sites [31]. The most obvious component of culture's contribution to economic development is the link between culture and tourism [32]. Cultural heritage is a rich resource for the travel and tourist industry, and cultural tourism is the most effective way to benefit from tangible or intangible legacies.
5. **Community participation:** Community participation is crucial to maintaining and revitalizing Heritage sites, which promotes economic growth and subsequently raises local communities' standards of living [33].
6. **Benefit Sharing:** Many stakeholders both inside and outside the protected area can gain from tourism through successful and efficient benefit-sharing [31]. In absence of benefit sharing, result will more than an alarming degradation of natural resources [34].
7. **Business and functional use:** Adaptive reuse is a recycling idea for buildings and sites in which legacy is preserved and passed along to future generations. This has a good impact on socio-cultural and economic values, hence it should be promoted in today's environment [35].
8. **Place attachments:** Place attachments which can spur collaborative efforts to better one's community [36], arise from fulfilling connections and great experiences shared with a particular location [37].
9. **Engender Skill:** Engender Skill in which enhancing the quality and accessibility of education and training for both genders to foster the innovative thin king, investment, technological advancement, enterprise growth, economic diversification, and competitiveness that economies require to create more jobs, better jobs, and a more cohesive society [38].
10. **Employment generated by the necessity to manage and maintain the historic structure:** An increasing level of job growth necessitates both excellent economic performance and the development and diversification of the services sector [39]. If management process of cultural heritage sites could create more job opportunities, such places could be sustainable.

11. **Boosting Local Economy:** If heritage conservation efforts are successful, current local companies will earn more money, and new jobs will be created or supported. There could possibly be new companies in the neighborhood [40].
12. **Sufficient resources/Budget/Investment for future restoration:** The establishment of financial instruments (for example, fees, subsidies, grants, taxes and other budgetary allocations) for heritage conservation should go hand in hand with active technical cooperation programs that support institutional growth and project preparation operations [41].
13. **Improvement of living conditions and quality of life:** It has been demonstrated that cultural heritage resources genuinely contribute to sustainability and a good standard of living for present and future generations [42].
14. **Road Network and Availability of public transport:** Urban transportation sustainability entails finding solutions to common issues with the movement of people and goods in urban environments, like reasonable journey times and the viability of building transportation infrastructure economically. Recent research has concentrated on how transportation networks affect the environment as a whole, human health, and social and economic aspects. Archaeological monuments have aesthetic and structural issues that can deteriorate in an urban setting due to the presence of many vibration sources, such as traffic vehicles [43].

7. Conclusion

The four peer-reviewed studies were analyzed with the goal of identifying the metrics used to measure the numerous advantages that cultural heritage conservation and regeneration can bring about. The analyses frequently mention sustainability, but because there is an imbalance between the aspects, it is rarely specifically addressed.

It is important to develop methods to assess how cultural heritage contributes to sustainable development and to find new, successful models for managing cultural resources sustainably. The development of instruments for assessing the relationship between cultural heritage and welfare and social cohesion categories are thus open subjects for future research.

Acknowledgments

The authors are appreciative of the help received during the study from the Department of Architecture at Pulchowk Campus, IOE. The authors are thankful to Prof. Dr. Sudha Shrestha, Prof. Dr. Sushil Bahadur Bajracharya, Dr. Sanjay Uprety and the Departmental Research Committee (DRC) members, for their invaluable advice, knowledge-delivery expertise, and encouragement throughout the study process.

References

- [1] UNESCO. Culture for sustainable cities, 2023.
- [2] Aihui Jiang, Jun Cai, Fulong Chen, Baolei Zhang, Zhiwei Wang, Qiaoyun Xie, and Sisi Yu. Sustainability assessment of cultural heritage in shandong province. *Sustainability*, 14(21):13961, 2022.
- [3] Alexey Cherepovitsyn and Olga Evseeva. Parameters of sustainable development: Case of arctic liquefied natural gas projects. *Resources*, 10(1):1, 2020.
- [4] WTO. Indicators of sustainable development for tourism destinations a guidebook (english version), 2004.
- [5] Federica Appendino. Heritage-related indicators for urban sustainable development: A systematic review. 4, 2018.
- [6] Johannes Siregar. The evolving cultural heritage concept: A theoretical review of cultural heritage in indonesia. 08:57–62, 2018.
- [7] Barbara Torggler, R Murphy, C France, and J Baltà Portolés. Unesco's work on culture and sustainable development evaluation of a policy theme final report. *Internal Oversight Service Evaluation Section Ios/Evs/Pi/145 Rev*, 2, 2015.
- [8] Mark Diesendorf. Sustainability and sustainable development. *Sustainability: The corporate challenge of the 21st century*, 2:19–37, 2000.
- [9] Bob Giddings, Bill Hopwood, and Geoff O'brien. Environment, economy and society: fitting them together into sustainable development. *Sustainable development*, 10(4):187–196, 2002.
- [10] Eila Jeronen. *Sustainability and Sustainable Development*, pages 2370–2378. 2013.
- [11] Erling Holden, Kristin Linnerud, and David Banister. Sustainable development: Our common future revisited. *Global environmental change*, 26:130–139, 2014.
- [12] Gro Harlem Brundtland. *Report of the World Commission on environment and development: "our common future."* UN, 1987.
- [13] Ben Purvis, Yong Mao, and Darren Robinson. Three pillars of sustainability: in search of conceptual origins. *Sustainability science*, 14:681–695, 2019.
- [14] Edward Barbier. The concept of sustainable economic development. *Environmental Conservation*, 14:101–110, 1987.
- [15] UNESCO. World heritage and sustainable development, 2015.
- [16] Donella H Meadows. Indicators and information systems for sustainable development. 1998.
- [17] Jianguo Wu and Tong Wu. Sustainability indicators and indices: an overview. *Handbook of sustainability management*, pages 65–86, 2012.
- [18] UN. *Indicators of sustainable development: Guidelines and methodologies*. Department of Economic and Social Affairs, United Nations, 2007.
- [19] Ingunn Gunnarsdóttir, Brynhildur Davidsdóttir, Ernst Worrell, and Silla Sigurgeirsdóttir. Review of indicators for sustainable energy development. *Renewable and Sustainable Energy Reviews*, 133:110294, 2020.
- [20] Maria Leus and Wouter Verhelst. Sustainability assessment of urban heritage sites. *Buildings*, 8(8):107, 2018.

- [21] David Throsby. Sustainability in the conservation of the built environment: An economist's perspective. In Jeanne Marie Teutonico Matero and Frank, editors, *Managing Change: Sustainable Approaches to the Conservation of the Built Environment*, pages 3–10. The Getty Conservation Institute Los Angeles.
- [22] Paloma Guzman. Assessing the sustainable development of the historic urban landscape through local indicators. lessons from a mexican world heritage city. *Journal of Cultural Heritage*, 46:320–327, 2020.
- [23] European Commission, Sport Directorate-General for Education, Youth, and Culture. *European framework for action on cultural heritage*. Publications Office, 2019.
- [24] Erica Avrami. Sustainability and the built environment: Forging a role for heritage conservation. 2011.
- [25] Ervi Liusman, DCW Ho, and JX Ge. Indicators for heritage buildings sustainability. *CESB 2013 PRAGUE-Central Europe Towards Sustainable Building 2013: Sustainable Building and Refurbishment for Next Generations*, 2013.
- [26] Barbara Sowińska-Świerkosz. Review of cultural heritage indicators related to landscape: Types, categorisation schemes and their usefulness in quality assessment. *Ecological Indicators*, 81:526–542, 2017.
- [27] Georges A Tanguay, Etienne Berthold, and Juste Rajaonson. *A comprehensive strategy to identify indicators of sustainable heritage conservation*. Centre de recherche en tourisme et patrimoine, 2014.
- [28] Snyder Group. The importance of preserving and promoting historic buildings, 2019.
- [29] Tudorache Petronela. The importance of the intangible cultural heritage in the economy. *Procedia Economics and Finance*, 39:731–736, 2016.
- [30] Donovan D. Rypkema. Heritage conservation and the local economy. *Global Urban Development Magazine*, 4(1):1–8, 2008.
- [31] Susan Snyman and Kelly S Bricker. *Living on the edge: Benefit-sharing from protected area tourism*, pages 1–15. Routledge, 2021.
- [32] Tüzin Baycan and Luigi Fusco Girard. Heritage in socio-economic development: Direct and indirect impacts. *Heritage, Driver of Development*, pages 857–860, 2011.
- [33] S. Mostafa Rasoolimanesh and Jaafar Mastura. *Community Participation toward Tourism Development and Conservation Program in Rural World Heritage Sites*, page Ch. 1. IntechOpen, Rijeka, 2016.
- [34] Safal Ghimire and Bishnu Raj Upreti. Community participation for environment-friendly tourism: the avenue for local peace. *The Journal of Tourism and Peace Research*, 2(1):55–69, 2011.
- [35] Vithyalakshmi, Latha, and Sathi Varshini. Adaptive reuse of heritage buildings. *International Journal of Novel Research and Development (IJNRD)*, 7(5 May 2022), 2022.
- [36] Lynne C. Manzo and Douglas D. Perkins. Finding common ground: The importance of place attachment to community participation and planning. *Journal of Planning Literature*, 20(4):335–350, 2006.
- [37] Edi Purwanto and Arnis Rochma Harani. Understanding the place attachment and place identity in public space through the ability of community mental map. In *IOP Conference Series: Earth and Environmental Science*, volume 402, page 012024. IOP Publishing.
- [38] ILO. Skills for improved productivity, employment growth and development. In *Report V, International Labour Conference, 97th Session*.
- [39] Done Ioan. Employment–cause and effect of the economic growth. *Procedia Economics and Finance*, 8:268–274, 2014.
- [40] Heritage Fund. Outcomes for heritage projects, 11/20/2023 2023.
- [41] Hari Srinivas. Financing for urban heritage and conservation, Tuesday, 21 November 2023 2015.
- [42] Eva Battis-Schinker, Sarah Al-Alawi, Robert Knippschild, Karolina Gmur, Sławomir Książek, Marta Kukuła, and Magdalena Belof. Towards quality of life indicators for historic urban landscapes–insight into a german-polish research project. *Environmental and Sustainability Indicators*, 10:100094, 2021.
- [43] Ivan Roselli, Vincenzo Fioriti, Irene Bellagamba, Marialuisa Mongelli, A. Tati, Marina Magnani, and Gerardo De Canio. *Urban transport vibrations and cultural heritage sites in Rome: the cases of the Temple of Minerva Medica and of the Catacomb of Priscilla*, volume 223. 2017.