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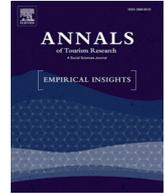
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A comprehensive analysis of threats to UNESCO WHSs in danger

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1. Introduction

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites (WHSs) program promotes the conservation of natural and cultural sites with outstanding universal value (OUV). The literature suggests that WHS inscription increases the attractiveness of and visitation to the site (Pachrová et al., 2018). With increased tourism at WHSs, the positive impacts of increased employment and revenue are accompanied by negative impacts. Pavlova et al. (2017) stated that 60% of the WHSs are exposed to at least one of four geological hazards—earthquakes, landslides, volcanic eruptions, or tsunamis. These WHSs must not only cope with the threats of natural disasters and climate change, but also bear the burden of increased visitation. Among the 1092 sites listed as UNESCO WHSs in 2018, 54 were struggling to retain their OUV due to various threats (unesco.org, 2020). This study examined the threats to 54 WHSs to understand their nature and severity and provide management implications.

2. Tourism, politics, and WHSs

The motivation for securing a site's place on the WHS list is to generate revenue through tourism (Ryan et al., 2011). Peltier (2017) stated that about 50% of natural WHSs are operating without a tourism management plan. With increased visitation comes the risk of degradation. Garrard et al. (2016) found that snow-covered areas and forested lands in Mt. Everest National Park were decreasing at different altitudes. Residents expressed their concerns regarding rapid economic development that puts pressure on natural resources and perceived tourism as the cause of this phenomenon. Although climate change cannot be fully addressed locally, anthropogenic activities can be controlled to protect the mountain ecosystem (Garrard et al., 2016). Residents' livelihoods depend on the continued existence and protection of WHSs. The loss of WHS status has a detrimental impact on local communities and their socio-economic condition (Pavlova et al., 2017).

Brown et al. (2019) explain how state parties avoid listing WHSs in danger as opposed to realizing the threats to them and finding support in the form of international investment to preserve them. The authors noted that the World Heritage Committee, an elected body representing 21 state parties, along with the documents prepared by experts in the World Heritage Center (WHC) and Advisory Bodies – the International Council on

Monuments and Sites (ICOMOS), the International Union for Conservation of Nature (IUCN), and the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM), allow inconsistencies for practical implementation and reinforcing inequity and politicization. Developed nations avoid inscription of their WHSs in danger through complex political, philosophical, and financial negotiations. This leads to WHSs constantly being “considered” but never “inscribed” in danger (Brown et al., 2019, p. 287). The developing nations are incompetent to proactively participate in diplomacy, lobbying, and political negotiations during the annual world heritage committee sessions (Meskell, 2014).

3. Methodology

Among the 1092 WHSs, 16 natural sites and 38 cultural sites were in danger. These sites are in 33 countries across five regions, representing 4.95% of all WHSs (Appendix 1). Initially, a list of these 54 WHSs was prepared that included each site's name, type, country of location, the number of criteria met, the year listed as a WHS, the year listed in danger, the number of unique threats, and the threats' recurrence scores since being listed in danger. These threats were clustered into 13 primary factors proposed by UNESCO. Each primary factor represents a unique theme. The presence or absence of the primary factor is analyzed to estimate the total number of primary factors affecting each WHS.

4. Findings and discussion

Sixty-six unique threats affected 16 natural and 38 cultural WHSs in danger (Appendix 2). Each site faces 9 unique threats on average and the threats' recurrence scores ranged from 1 to 211. These unique threats are grouped into 13 primary factors (Appendix 3). Threats related to management and institutional factors, human activities, buildings and development, and social/cultural uses of heritage are the most detrimental to WHSs. Certain WHSs in danger experience a high percentage of threat recurrence, signifying that the threats were persistent for a long time. Regardless of their recurrence percentages or number, the threats affecting these WHSs must be addressed. Management strategies for each WHS may differ depending on the number of threats present at the site and their severity.

In general, WHSs are affected by a combination of up to 9 primary factors, underscoring the complexity of the threats to WHSs (Appendix 4). The management of WHSs should focus on the complexity or severity of the

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threats. For instance, management strategies for WHSs suffering from 9 different primary factors will be different and multidimensional compared to WHSs with a lower number of primary factors. WHSs and their conservation should follow a strategic management process (Fig. 1). It is important to distinguish WHSs based on their type (i.e., cultural, natural, or mixed) and associated threats (i.e., the nature and severity of threats). Management strategies should be formulated based on the WHS type and the threats' nature and severity. Additionally, an assessment of the need for a locally based solution or collaboration at the regional, national, or international scale should be made. Finally, management strategies should be implemented to address threats and evaluate their effectiveness for the next management cycle.

Poor managerial practices threaten 36% of WHSs (Gale et al., 2019), a notion supported by the findings from this study. Landorf (2009) examined six exemplary WHS management plans adapted to manage other WHSs. WHSs were not actively planning and managing every dimension of economic and social sustainability; rather, they tended to focus on environmental sustainability. Based on this study's findings (Appendices 1 and 2), the intangible value of cultural sites appears to be more threatened than the tangible value of natural sites. Lwoga (2018) suggested that the WHSs possess both cultural value and functional socio-economic value in contemporary society. Thus, the establishment of integrative, development-minded policies and suitable legislative and institutional frameworks was suggested. A balanced approach to management must be prioritized.

The direct impact of tourism-related threats is minimal compared to other anthropogenic and non-anthropogenic threats. However, tourism-

related threats are related to other threats, such as poor management plans, and should not be underestimated. Visitors to heritage sites are often one-day visitors (Pachrová et al., 2018). Destinations that accommodate large numbers of one-day visitors versus those that accommodate multi-day visitors require different tourism plans. Besides threats from unsustainable tourism, many other threats continue to pose risks to WHSs. For instance, WHSs in the Mediterranean region are prone to floods and erosion and by 2100, the risk of flooding and erosion is likely to increase by 50% and 13%, respectively (Reimann et al., 2018). The Tropical Rainforest Heritage of Sumatra from Indonesia is in danger due to poaching (Pusparini et al., 2018).

Given the widespread nature of threats, successful conservation of WHSs requires collaboration at the local, national, or international level. Ineffective policies and practices must be changed to include all relevant stakeholders to develop a holistic plan. A geographical information system can be used to manage UNESCO WHSs (Barreca et al., 2017). Geiß and Taubenböck (2013) proposed the use of remote sensing to assess and minimize earthquake risks. Pusparini et al. (2018) reported that increased protection and law enforcement were used to tackle the problem of poaching. Intel and the China Foundation for Cultural Heritage Conservation established a partnership to protect and restore the value of the Great Wall of China (Zazulia, 2018). The plan was to utilize drones to detect fractures in the Great Wall of China so that repair and reconstruction plans can be executed more efficiently. Solutions must be sought using every possible avenue, including good governance, stringent policies, small- and large-scale collaboration, and the use of innovative technology.

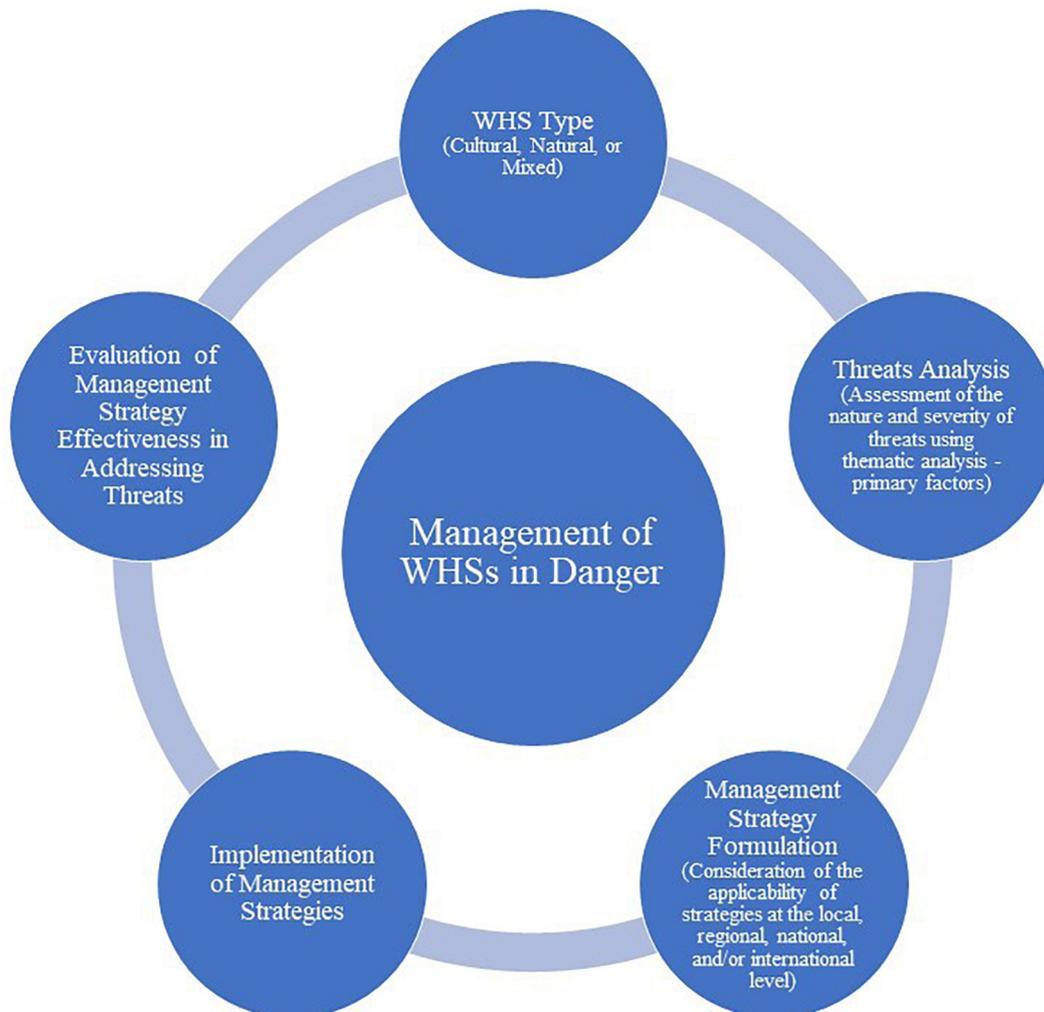


Fig. 1. A conceptual framework for WHSs management process.

Political maneuvering negatively affects the conservation status of WHSs. The findings demonstrate that WHSs in developing nations are more likely to be listed in danger (Appendices 1 and 2), while the number of WHSs in the danger category in developed nations is likely to be underreported. This will exacerbate the conditions of vulnerable WHSs. The state parties and their involvement in ongoing politics must be demotivated as it impedes the protection of WHSs. Whereas it undermines the value of UNESCO WHS listing because of the politics and the resulting outcome. The purpose of listing a WHS in danger is to secure financial assistance and international collaboration. However, this designation is often seen as a stigma to be avoided at any cost, leading to the continued degradation of these WHSs (Brown et al., 2019). A culture of communication, transparency, accountability, and mutual trust must be promoted among state parties to allow for the exchange of ideas and information regarding effective management practices.

5. Conclusion

WHSs are under tremendous pressure to retain their OUV intact. Threats to WHSs are multidimensional and should be tackled using a range of approaches from good governance to stringent policies, small- and large-scale collaboration, and the use of innovative technology. Even though minimal, lack of tourism management plan or poor management practices still pose threats to WHSs. Ongoing politics adversely affect the conservation statuses of WHSs leading to underreporting of WHSs in danger, and this needs to end. A strategic WHSs management process should be followed in addressing threats to promote successful conservation and management of WHSs.

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Declaration of Competing Interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.annale.2021.100013>.

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