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Mining Ghost Town Revitalization through Heritage Tourism Initiatives

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Abstract

This study examines the revitalization of mining ghost towns (MGTs) through heritage tourism, focusing on sustainability and heritage preservation. The study highlights the transformative potential of heritage tourism in revitalizing these towns, highlighting the economic resilience achieved through diversified local economies and responsible tourism practices. Cultural preservation ensures the endurance of unique identities and cultural legacies, sparking community pride and cultural exchange. Sustainability measures extend beyond heritage preservation, promoting environmental stewardship and long-term ecological well-being. Community engagement, educational initiatives, and responsible tourism practices are crucial in sustaining the heritage of these towns. The implications extend beyond individual communities, offering a model for responsible and sustainable tourism practices with global relevance. The significance of revitalizing MGTs through heritage tourism lies in preserving history, empowering communities, and creating vibrant, sustainable destinations for generations.

1. Introduction

Mining ghost towns (MGTs), the silent witnesses to bygone eras of resource extraction, stand as enigmatic remnants of history, culture, and industrial prowess [1]. These towns, once vibrant hubs of activity, have since been abandoned, leaving behind an evocative heritage that speaks to the very heart of our shared human experience [2]. In the recent years, as societies increasingly acknowledge the profound significance of these decaying settlements, there has been a growing interest in preserving and revitalizing them as heritage sites [1]. This study embarks on a journey to explore the multifaceted importance of MGTs as heritage sites, and more critically, unveils a spectrum of strategic interventions that can breathe new life into these forgotten corners of the past through heritage tourism.

MGTs have a significant historical, cultural, and economic importance beyond mere nostalgia. These cities exemplify the cyclical nature of

mining industries [3], with periods of success and downturns, labor variety [4], and the progress of mining technologies on display. They are cultural melting pots that reflect many languages, cultures, and folklore. These towns' ruins provide insights into technical progress and their influence on local economies. Importantly, they give the tourists an unfiltered peek into the past, generating a sensation of time travel. Recognizing the importance of these cities, historical tourism has evolved as a method of preserving them, revitalizing local economies, encouraging education, and guaranteeing their legacy for future generations. Regardless of the risks they confront, creative solutions may bring these ghost towns back to life, converting them into dynamic attractions that honour history while inspiring the present and future [5].

MGTs suffer a tangle of difficulties including economic decline, population loss, social and community concerns, environmental concerns, and

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preservation quandaries [6]. Economic distress caused by over-reliance on mining causes financial difficulties, while population loss and shifting demographics burden key services and community identity [7]. Environmental legacies endanger public health and impede tourism. It is critical to balance heritage preservation and economic revival, which necessitate new solutions that preserve the town's identity and character [8]. Despite these hurdles, the opportunity for rejuvenation and sustainable heritage tourism provides hope for conserving these resilient communities' distinctive historical and cultural legacy.

This study embarks on a journey to explore the intricate question at the heart of heritage preservation and community renewal:

"How can heritage tourism strategies be effectively employed to revitalize abandoned mining ghost towns, preserving their historical, cultural, and economic significance while ensuring long-term sustainability and benefiting local communities?"

Once teeming with activity, these towns face extinction owing to economic downturn and depopulation. It is critical to preserve their historical, cultural, and economic relevance. The task is revitalizing these communities while keeping their identity through sustainable heritage tourism [9]. This study strives to untangle these difficulties and provide policymakers and stakeholders with actionable information. These communities may survive and grow by embracing heritage tourism, ensuring that their extraordinary past is preserved for future generations [1].

The study analyses MGTs' multiple difficulties and potential, examining their historical, cultural, and economic relevance. The goals include analysing their value, recognizing the issues they confront, researching tourist potential, reviewing revival options, addressing sustainability concerns, and providing policy-makers and stakeholders with practical information. The overarching objective is to conserve these towns' rich historical and cultural legacies while revitalizing them through heritage tourism, promoting sustainability, and assuring their survival and profitability in the modern world.

This scholarly expedition explores the landscape of mining heritage tourism, ghost towns,

and revitalization strategies. The study aims to bridge gaps in the existing literature by weaving together insights and understanding where the fabric of knowledge remains incomplete. The study aims to enrich the academic dialogue and offer practical insights for policy-makers, heritage conservationists, and communities invested in preserving and sustainable revitalizing historically and culturally significant sites. The study focuses on the comprehensive integration of mining heritage and ghost towns, offering a holistic understanding of how these elements intersect and influence each other within the context of heritage tourism. It adopts an interdisciplinary approach to heritage tourism, combining historical context with qualitative data analysis and practical case studies. The study also delves deeper into sustainable revitalization, exploring how sustainable practices can be effectively integrated into heritage tourism initiatives to ensure the long-term well-being of both sites and surrounding communities. The study also examines revitalization efforts' economic and community impact, assessing tangible benefits such as job creation, revenue generation, and community well-being. The study emphasizes community involvement and ownership, highlighting successful models of community-based tourism initiatives that contribute to the authenticity of heritage tourism and foster a sense of ownership over cultural heritage. The study also examines the long-term sustainability of these initiatives, and considers emerging trends in heritage tourism and revitalization to provide insights into future developments. By addressing these gaps, the study aims to provide a more comprehensive and nuanced understanding of mining heritage tourism, ghost towns, and revitalization strategies, providing valuable insights that can inform future research, policy development, and practical initiatives in preserving and revitalizing these historically and culturally significant sites.

This study is grounded in a comprehensive theoretical framework integrating critical concepts to analyse mining heritage tourism, ghost towns, and revitalization strategies. The framework encompasses several critical theories (refer to Table 1).

Table 1. Key theories and their fundamentals.

Key theories	Theory fundamentals	References
Heritage tourism theory	Emphasizing the importance of authenticity in visitor experiences.	[9]
Cultural heritage conservation theory	Advocates for active community engagement, involving locals as key stakeholders.	[10]
Economic impact theory	Focuses on the economic benefits of revitalization including job creation and increased tourism revenues.	[7]
Sustainable tourism theory	Prioritizes minimizing ecological impact, ensuring environmentally sustainable practices.	[11]
Community-based tourism theory	Highlights initiative empowering residents and fostering inclusivity.	[2], [9]
Revitalization and adaptive reuse theory	Explores strategies like repurposing historic structures.	[4], [12]
Future trends and innovation theory	Examines emerging technologies and sustainability practices.	[1], [5], [7]
Place attachment theory	Investigates emotional connections between visitors, local communities, and heritage sites.	[12], [13]
Cultural landscape theory	Considers the broader context of heritage sites including their relationship with the natural environment and their role in shaping regional cultural identity.	[4], [9], [10]

This multifaceted framework enables a comprehensive exploration of mining heritage tourism, encompassing historical, cultural, economic, social, and environmental dimensions while staying attuned to evolving heritage tourism practices and ensuring the sustainable future of these sites.

Moreover, this study explores the significance of MGTs, heritage preservation, and heritage tourism. It begins with a literature review, revealing the diverse aspects of these sites and their role as heritage sites. The study also examines the global landscape of heritage tourism, drawing insights from successful cases. The study identifies gaps in existing knowledge, highlighting the need for deeper exploration into the challenges and potential for revitalizing MGTs amid economic decline and depopulation. The methodology section outlines a multidisciplinary approach including historical research, qualitative analysis, and case study methodology. This framework enables a comprehensive narrative that bridges the past with the present and outlines MGT's path toward a sustainable future. The historical context of these towns highlights boom and bust cycles, migration, technological innovation, and cultural diversity. However, beneath this facade of historical grandeur, challenges such as economic decline, job loss, and deteriorating infrastructure underscore the fragility of these communities. Amidst these challenges, a glimmer of hope emerges as an exploration of the potential for revitalization. The study draws inspiration from successful case studies, and outlines strategies to breathe new life into MGTs including heritage tourism, community engagement, and sustainable

development. The narratives of towns that have successfully navigated these challenges serve as beacons, illuminating the path forward. The study concludes by acknowledging the challenges of sustaining revitalization efforts and contemplating future trends that will shape the destiny of MGTs. The challenges and considerations remind us that the path to revival is marked by ongoing dedication, adaptability, and commitment to preserving the echoes of our past for future generations.

2. Literature Review

Within heritage tourism, mining heritage sites and ghost towns are captivating narratives that intersect history, culture, and economic transformation [4]. These sites serve as dynamic canvases, depicting human endeavour and resilience against the backdrop of abandoned mines and silent streets [14]. The academic discourse surrounding mining heritage tourism has been profound and extensive, unveiling the layers of significance these unique destinations hold [3]. In this literature review, we explore the wealth of existing scholarship, tracing the contours of knowledge illuminating the path of mining heritage tourism, ghost towns, and the strategies employed to reinvigorate these sites. Our journey commences by delving into the foundational aspects of mining heritage tourism, appreciating its historical and economic importance while recognizing its role as a preserver of cultural diversity. We then pivot towards the captivating enigma of ghost towns, those vestiges of boom-and-bust cycles that retain echoes of the past. However, within their evocative ruins, we confront intricate challenges and

prospects. This segues seamlessly into an exploration of strategies for revitalization, where the literature unveils a spectrum of approaches employed to breathe new life into these silent witnesses of history. As we embark on this scholarly voyage, we aim to synthesize the insights garnered from a wealth of research, thereby offering a comprehensive foundation for our research endeavour – one that seeks to contribute to the preservation, sustainability, and community enrichment inherent in mining heritage tourism and the revival of ghost towns.

2.1. Mining heritage tourism

Mining heritage tourism is a burgeoning field that delves into the rich historical, cultural, and economic tapestry woven within former mining sites and towns. Scholars and researchers have uncovered several salient themes that underscore the significance of this niche tourism sector [15], [16]. At its core, mining heritage tourism celebrates the historical importance of these sites. It serves as a living museum, elucidating the evolution of mining technologies, the struggles and triumphs of labour movements, and the ever-shifting economic landscapes shaped by mineral extraction [17]. Within these towns, an intricate narrative unfolds, enriched by the convergence of miners from diverse backgrounds [15]. This diversity has left an indelible mark on local traditions and heritage, reflecting the multicultural nature of these communities. The economic impact of mining heritage tourism has also been scrutinized. Scholars have diligently explored how these heritage sites stimulate local economies [7]. Visitors who flock to these locations contribute substantially through expenditures on accommodations, dining, guided tours, and the purchase of locally crafted goods [3], [9]. Furthermore, heritage tourism initiatives often create job opportunities, potentially revitalizing economically depressed regions, thus illustrating the potential for sustainable economic development through cultural preservation [16].

2.2. Ghost towns as heritage sites

Ghost towns, in particular, stand as intriguing facets of mining heritage tourism, with their unique challenges and opportunities that scholars have meticulously examined [18]. Preservation and authenticity are central themes when considering ghost towns as heritage sites [19]. The researchers emphasize the delicate balance between preserving these towns' historical and cultural integrity while

simultaneously seeking avenues for economic revitalization [18], [19], [20], and [21]. It is a careful dance, ensuring that the echoes of the past remain vivid, even as new life is breathed into these silent witnesses to history. Creating an engaging visitor experience is another focal point.

The literature underscores the significance of interpretive signage, guided tours, and immersive activities that educate and captivate visitors. These endeavours aim to transport tourists into the heart of the ghost town's history and culture, forging lasting memories and connections. Community involvement emerges as a recurring theme in successful ghost town revitalization efforts. The researchers underscore the importance of active participation from residents in decision-making processes [19], [21]. Their insights and expertise are invaluable, contributing not only to the authenticity but also to the sustainability of heritage tourism initiatives [20]. Engaging the community fosters a sense of ownership over their heritage, ensuring that revitalization efforts align with the needs and aspirations of those living amidst the echoes of history [22].

2.3. Strategies for revitalization

Mining heritage sites including ghost towns are being revitalized through various strategies. Heritage tourism development is a central approach, focusing on creating programs that immerse visitors in the area's history and culture [23]. Community-based tourism initiatives are another critical strategy, empowering residents to participate in guiding tours and managing museums. These initiatives foster a sense of ownership over the heritage, promoting social and economic transformation [24]. Partnerships and funding mechanisms are crucial in revitalization, with collaborations between government agencies, private enterprises, and non-profit organizations [25]. Securing funding, grants, and sponsorships is vital for supporting preservation and development projects. Sustainability is also a key component of successful revitalization strategies, as it is central to conserving natural resources and mitigating environmental impact [26]. Marketing and promotion strategies are also essential, with practical outreach efforts such as social media, online platforms, and targeted marketing campaigns [23]. These strategies ensure that mining heritage sites' compelling stories reach a global audience, maximizing their impact and potential.

The literature on mining heritage tourism, ghost towns, and revitalization strategies highlights the importance of balancing preservation and economic development, community involvement, and sustainable practices. This body of work offers valuable insights and guidance, highlighting the potential of mining heritage tourism in preserving the echoes of our past while forging a sustainable future.

3. Methodology

The study aimed to provide a nuanced understanding of the complexities and dynamics surrounding mining heritage tourism and the revitalization of ghost towns. It began with an

extensive literature review, exploring case studies involving mining heritage sites and MGTs from diverse geographic regions. This allowed for identifying commonalities and variations in revitalization strategies, economic impacts, and community involvement across a spectrum of sites. Thematic analysis was employed to discern recurring themes and patterns related to heritage preservation, community engagement, and revitalization strategies. Comparative analysis was used to synthesize and compare findings across the various case studies, facilitating the identification of overarching trends, successful strategies, and challenges consistent or distinct among mining heritage sites and MGTs (refer to Figure 1).

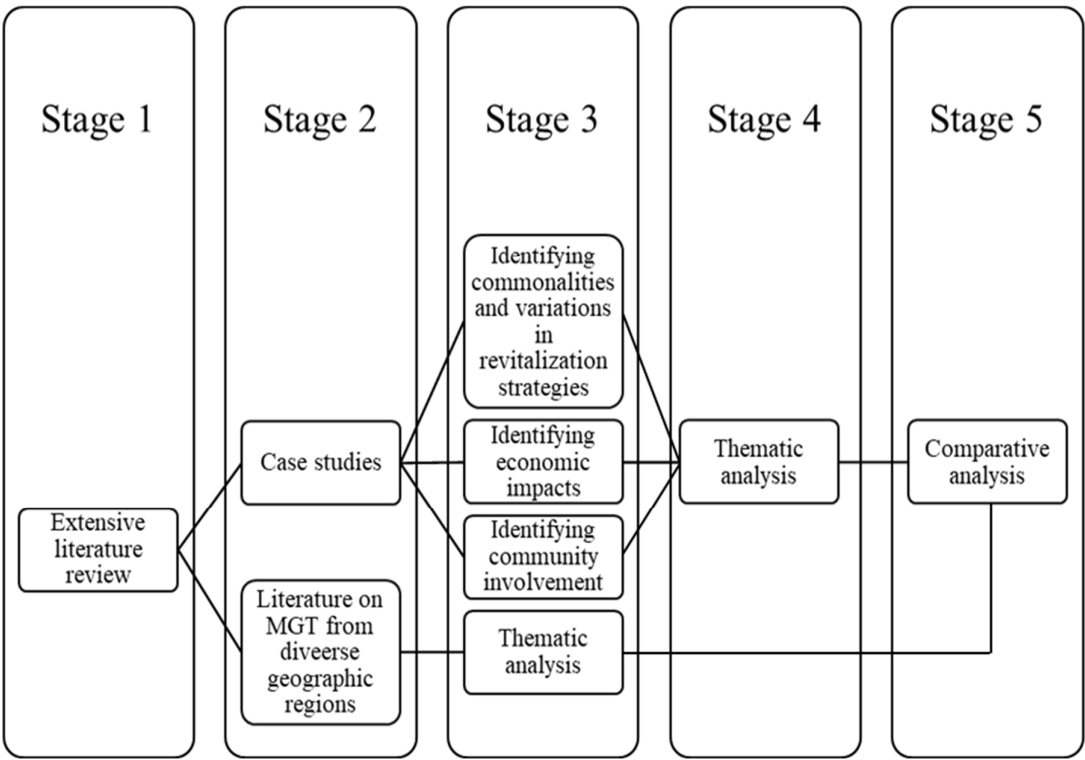


Figure 1. Research methodology flowchart.

However, one limitation of this study is the sample size. While case studies offer in-depth insights, the number of sites explored may not represent the entire spectrum of global mining heritage sites and ghost towns. This implies that findings may not be universally applicable. The contextual nature of case studies can restrict the generalizability of findings. The qualitative nature of the data collection process introduces subjectivity, and researchers' interpretations and biases could influence the analysis. The study's duration may limit the ability to capture long-term impacts and changes resulting from revitalization

efforts. Some outcomes may evolve over extended periods, which were beyond the scope of this study.

4. Historical Significance of MGTs

MGTs are relics of a bygone era, with their roots deeply embedded in the history of mineral extraction and the pursuit of wealth. To appreciate their historical context, we must journey back to the 19th and early 20th centuries, marked by the feverish quest for valuable minerals such as gold, silver, copper, coal, and more (refer to Appendix A). During the mid-19th century, gold rushes in

regions like California, Colorado, and South Africa attracted miners worldwide, rapidly establishing mining towns [27]. Subsequently, a late 19th-century silver boom occurred in places like Nevada and Colorado, leading to the founding of towns focused on silver extraction. Mining copper, coal, and iron ore in regions such as Arizona, Michigan, and Pennsylvania also fuelled industrialization and economic growth. However, as mineral deposits dwindled and market demands shifted, coupled with technological advancements, labour disputes, and environmental concerns, these towns faced decline and eventual abandonment [28].

MGTs are historical archives that preserve the challenges and triumphs of early miners and settlers. They showcase diverse cultural backgrounds, unique traditions, and cuisines (refer to Figure 2). Economically, these towns contributed to regional and national development, creating jobs and economic growth [7]. Many have become heritage tourism destinations, attracting visitors and revenue for local economies. Preserving these towns presents challenges in heritage conservation and adaptive reuse, requiring a delicate balance between protection and revitalization [5], [6]. They also offer insights into architectural and technological evolution [9].

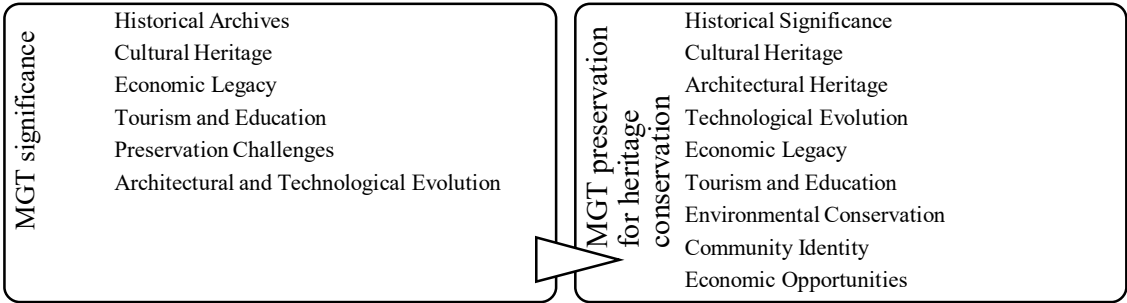


Figure 2. List of MGT significance and preservation for heritage conservation.

MGT is a living testament to an era of exploration, exploitation, and economic growth. They hold a unique place in regions' historical, cultural, and economic fabric worldwide, making them valuable heritage sites and sources of fascination for historians, tourists, and preservationists alike [29]. MGTs are essential for heritage conservation due to their historical significance, representation of diverse cultural legacies, architectural evolution, and technological advancements. These towns offer insights into past inhabitants' lives, fostering appreciation and understanding [27]. They also showcase architectural evolution, providing a window into technological progress. Economically, they play a vital role in regional and national growth, offering economic diversification and sustainability lessons [7], [9]. Preserved ghost towns are valuable educational resources, attracting tourists, students, and researchers. Environmentally, preservation efforts can positively impact surrounding ecosystems, involving habitat and wildlife conservation [8]. Local communities see these towns as a sense of identity and pride, inspiring heritage conservation efforts [11], [26]. Finally, preserving MGTs creates economic opportunities through heritage tourism and revitalization initiatives, generating revenue, job opportunities,

and economic revitalization for nearby communities.

In conclusion, preserving MGTs is vital for heritage conservation as it safeguards historical, cultural, architectural, and technological heritage. These towns are valuable educational resources, contribute to environmental conservation, strengthen community identity, and offer economic potential. By recognizing their significance and investing in their preservation, we ensure that the rich tapestry of our industrial and cultural past continues to be woven into the fabric of our present and future.

5. Challenges Faced by MGTs

MGTs or abandoned communities scattered across the landscapes of mining regions worldwide confront a litany of formidable challenges that have shaped their desolate present [30]. Chief among these challenges is the inexorable grip of economic decline, as the finite nature of mineral resources often leaves these towns economically adrift. This decline, in turn, begets the decay of critical infrastructure, with historic buildings weathered by time and essential services eroded by neglect. Concurrently, the exodus of residents seeking opportunities beyond the confines of these fading towns deepens the specter of depopulation [5].

These interconnected challenges form the crucible within which the future of MGTs is forged, inviting exploration of revitalization strategies that honour

their rich past while charting a sustainable course forward (refer to Table 2).

Table 2. Challenges faced by MGTs and their root causes and effects.

Challenges	Root cause	Affects	Details	Reference
Economic Decline	MGT faces economic challenges due to mineral resource depletion, causing the town's financial foundation to collapse when primary income sources like gold, silver, or coal are exhausted or unviable.	Job loss	Closing mines and related industries lead to significant job losses, affecting miners, support staff, and businesses catering to the mining community.	[4], [7], [31]
		Economic dependence	These towns, largely dependent on a single industry, are highly susceptible to economic fluctuations and resource depletion due to their lack of diversification.	[7], [9], [11]
		Declining property values	Economic decline often reduces property values, making homes and commercial properties less appealing to investors and potential residents.	[32], [33], [34]
Infrastructure Decay	MGT's infrastructure is deteriorating due to years of neglect, weathering, and inadequate maintenance.	Building dilapidation	Historic buildings often suffer from structural damage, rot, and weather-related wear, making revitalization efforts more challenging due to their deterioration over time.	[32], [33], [34]
		Utility breakdown	Infrastructure such as water supply systems, sewage systems, and electrical grids may be outdated or disrepair, rendering them inefficient or non-functional.	[32], [33], [35]
		Environmental contamination	Mining operations often cause environmental contamination, resulting in polluted water sources and soil, which can be costly and complex.	[4], [9], [11], [34]
Population Loss	The exodus of residents is a common trend in MGTs, leading to depopulation.	Lack of employment	With the closure of mines and industries, employment opportunities vanish, compelling residents to seek work elsewhere.	[11], [34], [36], [37]
		Aging population	The population may consist of older residents who experienced the town's glory, while younger generations often migrate to urban areas for better opportunities.	[37]
		Limited services	As populations decline, essential services such as healthcare, education, and retail become unsustainable, discouraging residents from staying.	[4], [7], [34], [37]

Addressing these challenges requires a multifaceted approach that combines heritage preservation, community engagement, and economic diversification. Successful revitalization initiatives focus on restoring historical buildings, attracting tourists, and fostering a sense of community ownership. Overcoming these hurdles is essential to ensure the preservation and sustainable revitalization of these historically and culturally significant MGTs.

6. Heritage Tourism Potential and Sustainable Competitive Advantages

MGT serves as a captivating heritage tourism destination, offering visitors a glimpse into the challenges and triumphs of early settlers and miners. Their appeal lies in their historical significance, showcasing the boom-and-bust cycles of mining and providing valuable insights into past socioeconomic dynamics [38]. These towns also reflect cultural diversity, with influences seen in architecture, cuisine, and cultural festivals. Their well-preserved historic buildings, from miners'

cabins to Victorian-era structures, provide tangible connections to the past, highlighting the evolution of construction techniques. Additionally, MGTs offer educational opportunities through museums, interpretive centers, and guided tours, making them ideal for school groups and educational programs [37], [39]. Situated in picturesque landscapes, these towns provide outdoor activities such as hiking, biking, wildlife viewing, and photography, enhancing the tourism experience. Exploring abandoned buildings and mineshafts adds an element of adventure, allowing tourists to step into the shoes of early prospectors. Cultural events and reenactments bring history to life, featuring demonstrations like gold panning and blacksmithing [40]. Furthermore, heritage tourism contributes to the economic potential of these towns, injecting life into local economies, creating jobs, and supporting economic revitalization efforts [36]. Revenue generated from tourism aids in preservation and restoration, ensuring the protection of historic structures and cultural heritage [41]. However, a delicate balance between tourism and preservation requires sustainable

practices, community involvement, and responsible development to safeguard these fragile historical sites [42]. When managed effectively, MGTs can continue to captivate and educate visitors while preserving their unique historical and cultural legacies.

MGT possesses sustainable competitive advantages (SCAs) in heritage tourism due to its unique attractions and cultural significance. The historical authenticity of these towns, marked by the genuine wear and tear of time, offers an immersive experience, setting them apart from artificially recreated tourist destinations [40]. Their well-preserved or weathered structures showcase architectural diversity, reflecting the evolution of construction techniques and styles. As a multicultural melting pot, MGT celebrates diverse heritage in cuisine, language, and customs, enriching the visitor experience and attracting culturally curious tourists. Educational resources including museums and guided tours offer valuable historical context and hands-on learning, making MGTs attractive to schools and educational tour operators [39]. Moreover, MGTs serve as gateways to outdoor adventures including hiking, biking, wildlife viewing, and photography, enhancing their appeal and diversifying their visitor base. The sustainable preservation efforts of these towns, funded by tourism revenue, ensure ongoing protection of cultural heritage and historical authenticity [42]. This commitment positions MGTs as a responsible and forward-thinking heritage destination, aligning with the values of modern travellers seeking sustainable and ethical tourism experiences. The delicate interplay of historical authenticity, architectural heritage, cultural diversity, educational experiences, outdoor adventures, and sustainable preservation collectively positions MGTs as an enduring and appealing heritage tourism destination capable of captivating diverse visitors while preserving its historical legacies for future generations.

7. Strategies for Revitalization

MGT can be revitalized through heritage tourism as a strategic imperative, focusing on sustainable practices. These towns hold a unique opportunity to attract modern visitors and secure an enduring edge in the competitive tourism market [43]. A transformative strategy that combines preservation [4], education, culture [44], outdoor adventure, community engagement [39], and responsible marketing [44] can form the bedrock of SCA. Strategies for SCA include preserving

historical structures sustainably [44], maintaining historical authenticity [41], promoting sustainable education [45] through interpretive centers and museums, promoting cultural events and festivals [11], promoting outdoor activities aligned with sustainability [44], and highlighting the ecological significance of surrounding natural landscapes [39], [46]. Community engagement is crucial for SCA, with community-driven sustainability and sustainability as a community value shaping revitalization efforts and fostering a strong connection between residents and sustainable heritage tourism [47]. Marketing and promotion for sustainable impact involve sustainable branding, collaboration with sustainable travel agencies, and accessibility and infrastructure with sustainability in mind [48]. Sustainable transport solutions and visitor facilities should prioritize sustainable practices, reducing the town's carbon footprint, and aligning with modern travellers' sustainability preferences [44]. Environmental stewardship should be a central SCA tenet, with sustainable practices implemented throughout the town's operations and educated about their roles in conservation [49], [50]. Diversification should encourage economic diversification while promoting sustainable businesses and practices, ensuring long-term community and environmental well-being [40]. Adaptive reuse with sustainability at its core should explore opportunities for adaptive reuse while prioritizing sustainability [38]. Conversions should uphold energy efficiency, utilize renewable resources, and honour the town's historical and cultural significance [33]. Feedback-driven sustainability can be leveraged to adapt revitalization strategies that align with evolving sustainability expectations and preferences [47]. Incorporating sustainability into every facet of revitalization transforms MGTs into SCA hubs, positioning them as premier destinations for responsible and sustainable heritage tourism by championing historical authenticity, cultural preservation, community engagement, and environmental stewardship.

Within the comprehensive tapestry of strategies for revitalizing MGTs through heritage tourism, various thematic threads weave together to form a multifaceted approach rooted in sustainability. These sub-sections, from preservation and restoration to community engagement and marketing, epitomize the intricacies of SCA underlying this transformative journey [51], [52]. Through this interconnected framework, we recognize that sustainable preservation and restoration preserve historical authenticity [53],

educational and cultural initiatives celebrate diversity [54], and outdoor adventures and community engagement breathe new life into these once-forgotten communities [55]. Amid it all, marketing strategies and infrastructure development [56] are seamlessly aligned with sustainability values, underscoring the

commitment to responsible tourism [57]. Moreover, preserving environmental and cultural heritage weaves an enduring thread through these strategies, illuminating the path forward for MGTs as a sustainable, competitive, and irresistible heritage tourism destination [58], [59], and [60] (refer to Table 3).

Table 3. Strategies for revitalization of MGTs and their implication ways.

Strategies	Implication ways	Example	Reference
Preservation and Restoration Strategies	1. Preserve historical structures sustainably. 2. Sustainable preservation for authenticity. 3. Period-appropriate restoration. 4. Infrastructure renewal.	Bodie State Historic Park in California, USA (refer to Table 4)	[61], [62]
Educational and Interpretive Strategies	1. Sustainable eEducation through Interpretive centers. 2. Interactive sustainability exhibits. 3. Sustainable guided tours. 4. Promote educational experiences.	Deadwood, South Dakota, features interpretive centers and museums that educate visitors about the town's history through interactive exhibits and guided tours, including gold rush origins and Wild West days.	[61], [63], [64]
Cultural Engagement Strategies	1. Cultural sustainability celebrations. 2. Historical reenactments with a message. 3. Community-driven Cultural initiatives. 4. Cultivate cultural diversity.	Ballarat, Victoria, Australia, celebrates its multicultural heritage through events like the Ballarat Heritage Festival, featuring food festivals, music performances, and cultural exhibitions.	[65], [66], [67], [68]
Outdoor Adventure and Nature Strategies	1. Sustainable adventure tourism promotion. 2. Eco-friendly outdoor activities. 3. Highlight ecological significance. 4. Encourage responsible exploration.		[61], [69], [70]
Community and Local Engagement Strategies	1. Sustainable community involvement. 2. Sustainability as a community value. 3. Fostering community pride. 4. Community-based sustainable events.	Bisbee, Arizona (refer to Table 4)	[63], [64], [71]
Marketing and Promotion Strategies	1. Sustainable branding and identity. 2. Collaborative marketing for sustainability. 3. Promote sustainable travel options. 4. Convey sustainability in promotional materials.	Virginia City, Nevada, uses sustainable branding and marketing strategies to attract tourists, emphasizing historical authenticity, cultural richness, and sustainable tourism practices.	[61], [65], [71]
Accessibility and Infrastructure Strategies	1. Sustainable transportation options. 2. Sustainable visitor facilities. 3. Green building and energy efficiency. 4. Renewable energy integration.	Central City, Colorado, has enhanced its appeal by introducing shuttle services and improving transportation options, thereby reducing the environmental impact of individual vehicle traffic.	[61], [69], [70], [71], [72]
Sustainability and Conservation Strategies	1. Environmental stewardship and education. 2. Diversify sustainably beyond tourism. 3. Promote sustainable businesses. 4. Emphasize conservation efforts.	Waihi, New Zealand (refer to Table 4)	[65], [73], [74]
Adaptive Reuse and Economic Strategies	1. Sustainable adaptive reuse opportunities. 2. Historical preservation within economic development. 3. Sustainable economic diversification. 4. Incorporate renewable resources.	Jerome, Arizona (refer to Table 4)	[70], [71], [75]
Feedback-Driven Sustainability Strategies	1. Visitor feedback for continuous improvement. 2. Adaptive strategies based on visitor insights. 3. Align revitalization with changing preferences.	Leadville, Colorado, USA (refer to Table 4)	[74], [76]

These categorized strategies encompass a comprehensive and well-rounded approach to revitalizing MGTs through heritage tourism while adhering to sustainability principles. Moreover,

these examples demonstrate that successfully implementing these strategies is possible and vital for restoring MGTs through heritage tourism. Organizing them into thematic sub-sections makes

it easier to develop a structured and cohesive revitalization plan tailored to each town's unique needs and objectives.

8. Case Studies

Within the narratives of these captivating case studies, the journey of revitalizing MGTs through heritage tourism comes alive, each story painting a vivid picture of transformation and renewal. Once facing economic decline, Bisbee found its strength in community engagement and adaptive reuse, crafting a unique cultural experience. Frozen in time, Bodie is a testament to the power of historic preservation and restoration. Leadville's

adaptability, fueled by visitor feedback and sustainability, showcases the importance of evolving. Through environmental stewardship, Waihi offers a responsible tourism model deeply rooted in conservation. Jerome's renaissance, driven by adaptive reuse and economic diversification, exemplifies the revival of a once-declining town. These interconnected tales illuminate the effectiveness of diverse strategies, from community-driven initiatives to environmental sustainability, in resurrecting the legacies of MGTs as enduring and vibrant heritage tourism destinations [77], [78], [79], [80], [81], [82] and [83] (refer to Table 4).

Table 4. Comparative analysis of case studies and their revitalization strategies.

Case study	Background	Revitalization strategy	Implementation	Analysis
Bisbee, Arizona, USA	Once a prosperous copper mining town with rich mineral deposits, experienced economic hardship and population loss in the mid-20th century. By the 1970s, it transformed into a quirky, artsy enclave with a tight-knit community.	Community engagement and adaptive reuse	Revival was primarily driven by its residents, who embraced its unique charm and history. Old mining structures were transformed into art studios, galleries, boutiques, and eateries, while the Bisbee 1000 Stair Climb attracted visitors by celebrating its past.	Success is attributed to its authentic, community-driven approach, preserving its historic character and fostering local entrepreneurship. This unique identity attracts tourists seeking cultural experiences, and residents' engagement ensures sustainability.
Bodie, California, USA	Once a bustling gold mining town in the late 1800s, became a ghost town due to declining mining and residents leaving, becoming a State Historic Park in 1962.	Preservation and restoration	Bodie State Historic Park preserves the town's historical authenticity, restoring buildings to late 1800s conditions and featuring period-accurate artifacts. Visitors can explore the town's streets and interiors, understanding early residents' challenges.	Preservation strategy effectively attracts tourists with its authentic time-capsule experience, ensuring its status as an iconic heritage tourism destination and preserving the town's legacy, attracting history enthusiasts.
Leadville, Colorado, USA	A prosperous silver mining town experienced economic hardship in the late 19th century due to declining mining, resulting in population fluctuations and financial instability.	Feedback-driven sustainability	Leadville is implementing sustainable tourism practices such as waste reduction and responsible outdoor activities, to understand visitor preferences better and improve services.	Sustainable tourism approach, focusing on eco-conscious travellers, has made it relevant in a changing tourism landscape, contributing to its economic sustainability and demonstrating the importance of staying informed about visitor preferences.
Waihi, New Zealand	A gold mining town has a history of environmental issues such as water pollution and landscape changes.	Sustainability and conservation	Promotes environmental stewardship through sustainable mining practices and responsible resource extraction while educating tourists about the town's commitment to conservation through guided tours.	Commitment to environmental sustainability aligns with modern travelers' values, showcasing responsible mining practices and conservation. This approach preserves natural surroundings and enhances the town's appeal in the heritage tourism market.
Jerome, Arizona, USA	A prosperous copper mining town in the early 20th century experienced economic decline and population loss due to dwindling mining operations.	Adaptive reuse and economic diversification	Transformed old mining structures into boutique hotels, art galleries, and restaurants, attracting artists and entrepreneurs to invest in its revival and fostering a vibrant arts and dining scene.	Success is attributed to its adaptive reuse approach, which preserves historical character while boosting economic growth. The town's unique blend of history, art, and dining attracts tourists, revitalizing the local economy and securing its heritage tourism status.

In summary, these case studies illustrate the effectiveness of various strategies in revitalizing MGTs through heritage tourism. Community engagement, preservation, adaptive reuse, sustainability, and responsiveness to visitor feedback have all played crucial roles in preserving

the historical significance of these towns while making them appealing and sustainable destinations for tourists [78], [79], [81], and [83]. These approaches showcase the resilience and adaptability of MGTs in the face of economic

decline, ensuring their legacies live on for future generations to enjoy and learn from.

9. Impacts and Benefits

As tourists wander through these once-abandoned landscapes, their presence breathes life into the forgotten echoes of history, reinvigorating towns that had faced economic decline and population loss. The impacts of heritage tourism extend far beyond the mere appreciation of

historical artifacts; they ripple through the fabric of these communities and their surroundings [7], ushering in an economic revival [84], instilling a renewed sense of identity [62], and safeguarding cultural legacies [85]. In this interconnected narrative, we delve into the economic, social, and cultural dimensions of heritage tourism's profound influence on MGTs and the neighbouring communities, shedding light on the transformative power of preserving the past for a vibrant future (refer to Table 5).

Table 5. Impacts and benefits of reviving MGTs.

Benefits	Transformation domains	Impacts	Reference
Economic impacts and benefits	Economic revitalization	Heritage tourism boosts local economies by generating revenue through visitor spending on accommodations, dining, shopping, and activities, potentially reviving struggling towns.	[86], [87]
	Job creation	The tourism industry offers employment in hospitality, food service, retail, and tour guides, reducing unemployment and outward migration while providing livelihoods for residents.	[88], [89]
	Business development	Tourist demand can stimulate entrepreneurship and small business growth, promoting economic diversification and a more resilient local economy.	[90], [91], [92]
	Heritage preservation	Heritage tourism revenue aids in preserving and restoring historical structures and landmarks, ensuring the long-term conservation of cultural heritage assets.	[88], [89], [93]
Social impacts and benefits	Community pride	Heritage tourism fosters community pride and identity by connecting residents to their town's history and cultural heritage, valuing their role in its preservation.	[88], [93], [94]
	Cultural exchange	Interaction with diverse tourists fosters cultural exchange, allowing locals to gain a broader perspective and tourists to learn about the town's unique culture.	[90], [91], [92]
	Enhanced quality of life	The development of improved infrastructure and amenities including better roads, healthcare, and recreational facilities can enhance the quality of life for residents.	[87], [93], [94]
	Education and awareness	Heritage tourism promotes historical awareness and knowledge sharing through educational programs and interpretive centers, educating tourists and locals about a town's significance.	[95], [96]
Cultural impacts and benefits	Preservation of heritage	Heritage tourism promotes the preservation of cultural and historical assets like architectural landmarks, traditions, and artifacts, which are crucial for maintaining a town's distinctive character.	[91], [97]
	Cultural celebrations	Festivals and cultural events are integral to a town's identity, celebrating local customs, traditions, and history, allowing for cultural expression.	[90], [98], [99]
	Interpretation and storytelling	Tourism often encourages storytelling and interpretation of town history, fostering a renewed interest in local legends, folklore, and oral histories.	[88], [94], [100], [101]
	Multiculturalism	MGT can serve as multicultural hubs, attracting visitors worldwide, enriching local culture, and fostering cross-cultural interactions.	[100], [102]

While heritage tourism offers numerous benefits, challenges must be addressed such as managing increased tourism-related traffic, preserving the town's authenticity, and ensuring that the economic benefits are distributed equitably among the community. Effective planning and sustainable practices are essential to maximize the positive impacts and minimize any adverse consequences of heritage tourism on MGTs and their surrounding communities.

10. Challenges and Considerations

In the intricate tapestry of MGTs through heritage tourism, a complex landscape of challenges and considerations comes to the fore, intricately interwoven with the promise of economic resurgence, cultural preservation, and community cohesion. While heritage tourism holds the potential to breathe new life into these historic landscapes, it also raises critical questions: How can the necessary funding be secured to support revitalization? How can the diverse voices within

the community be harmonized in the face of change? How can the delicate balance between preservation and development be maintained? Moreover, what happens when strategies geared towards SCA potentially clash with the imperative of heritage conservation? These questions underscore the need for thoughtful navigation, community involvement, and sustainable planning

to ensure that the revitalization of MGTs is both enduring and respectful of its unique historical legacies. In this interconnected narrative, we explore the challenges and considerations accompanying the transformative journey of heritage tourism in these resilient communities, where the past converges with the promise of a vibrant future (refer to Table 6).

Table 6. Challenges and considerations while reviving MGTs.

Domains	Challenges	Considerations	Reference
Funding and resource allocation	Revitalization efforts often require significant financial resources for preservation, infrastructure development, marketing, and community engagement.	Collaborate with government agencies, grants, and heritage preservation organizations to secure funding. Prioritize investments based on long-term sustainability and community impact.	[103], [104], [105]
Community involvement and engagement	Achieving community buy-in can be challenging, as some residents may have diverse opinions on the direction of revitalization.	Facilitate open dialogues, involve community members in decision-making, and ensure their voices are heard. Emphasize the benefits of heritage tourism for the local economy and culture.	[104], [106], [107]
Balancing preservation and development	Balancing the preservation of historical authenticity with the need for modern infrastructure and amenities can be complex.	Develop guidelines and zoning regulations that respect the town's historical character while allowing for necessary improvements. Engage preservation experts to ensure that any changes align with heritage conservation goals.	[108], [109], [110], [111]
Potential conflicts with SCA	Strategies prioritizing SCA such as upscale developments may clash with preserving the town's historical and cultural integrity.	Strive for a balance between SCA and heritage preservation. Ensure that any SCA-driven initiatives align with the town's identity and values.	[110], [112], [113]
Infrastructure and accessibility	Upgrading infrastructure to accommodate tourists can be costly and may disrupt the town's character.	Implement infrastructure improvements incrementally and sustainably. Focus on projects that enhance both visitor experience and resident quality of life.	[114], [115], [116], [117]
Managing tourism impact	Increased tourism can strain resources, create congestion, and potentially lead to environmental degradation.	Develop and enforce responsible tourism practices, including waste management, traffic control, and visitor education. Limit tourist numbers if necessary to protect the town's heritage and natural surroundings.	[110], [118], [119], [120]
Addressing environmental concerns	MGT may have environmental challenges from past mining operations that need remediation.	Collaborate with environmental agencies to assess and address any contamination or ecological issues. Communicate openly with visitors about environmental conservation efforts.	[104], [105], [121], [122], [123]
Equitable economic benefits	Ensuring that the economic benefits of heritage tourism are distributed equitably among the local community can be a concern.	Implement strategies directly benefiting residents, such as job training programs, community reinvestment, and affordable housing initiatives.	[107], [108], [124], [125]
Maintaining authenticity	Striking a balance between attracting tourists and preserving the town's authenticity can be challenging.	Develop clear guidelines for businesses and property owners to maintain historical aesthetics. Encourage businesses to offer authentic experiences that align with the town's heritage.	[111], [113], [126], [127]
Overcoming seasonality	Some MGTs may face significant seasonality, with tourism peaking during certain times of the year.	Diversify the range of activities and events throughout the year to mitigate the effects of seasonality. Develop strategies to attract off-season visitors.	[105], [109], [125], [128]

Navigating these challenges and considerations requires careful planning, community engagement, and a commitment to sustainable and responsible heritage tourism practices. By addressing these issues thoughtfully, MGTs can revitalize their economies, preserve their cultural heritage, and create lasting value for residents and tourists.

11. Sustainability and Preservation

In the intricate dance of revitalizing MGTs through heritage tourism, the fusion of sustainability and heritage preservation becomes a harmonious symphony. This delicate integration of environmental stewardship and cultural conservation is not merely a matter of convenience;

it's a fundamental balancing act ensuring these historic places' economic revival remains in harmony with their unique identities. As the past converges with the promise of a vibrant future, this narrative explores how these twin imperatives are interwoven into revitalization strategies, forming the cornerstone of a holistic and enduring approach that respects the legacy of MGT.

In revitalizing MGTs through heritage tourism, the seamless integration of sustainability and heritage preservation is paramount. These two facets are inextricably linked, creating a holistic approach that ensures revitalization brings economic benefits and safeguards these historic locations' cultural and environmental essence (refer to Table 7).

Table 7. Ways of sustaining and preserving MGTs.

Domains	Sustaining and preserving methods	References
Adaptive reuse	Repurposing existing structures preserves town's historical fabric and aligns with sustainability principles by reducing construction needs, conserving resources, and minimizing environmental footprint.	[129], [130], [131]
Sustainable building practices	Green building materials and technologies preserve architectural features, enhance energy efficiency, and reduce ecological impact, preserving heritage while adhering to modern environmental standards.	[132], [133], [134]
Responsible land and resource Management	The goal is to minimize the environmental impact of tourism and historical mining activities, thereby preserving the natural environment for future generations.	[129], [134], [135]
Upgrade infrastructure	The town is enhancing its sustainability by incorporating eco-friendly materials and technologies, preserving its original layout and infrastructure, and promoting energy-efficient lighting and transportation options.	[129], [130]
Celebration of cultural traditions and historical narratives	Sustainability is promoted through education on heritage conservation, fostering responsibility among stakeholders, and protecting historical sites and artifacts from damage or theft.	[128], [130], [131]
Sustainable tourism practices	Promoting responsible behaviours like "leave no trace" minimizes visitors' impact on the town's heritage and environment, reinforcing the importance of stewardship.	[132], [133], [134], [135]
Engaging local community	Active resident participation in revitalization aligns with their values, fostering ownership and responsibility for sustainable development and heritage conservation in the town.	[133], [134], [136]

Sustainable revitalization strategies are adopted to align economic activities with a town's heritage, enhancing the community's well-being and preserving its heritage. Heritage preservation involves promoting an understanding of the town's history and cultural significance. At the same time, sustainability efforts provide educational programs that inform visitors and residents about the ecological importance of the town's surroundings. This comprehensive approach ensures that revitalization's cultural and environmental aspects are effectively conveyed. Integrating sustainability and heritage preservation into revitalization strategies for MGTs is a holistic, enduring commitment that respects and celebrates its historical and environmental legacies. These strategies serve as the cornerstones for lasting benefits that shape the future of these communities, and have broader impacts on the heritage tourism landscape. The enduring influence of sustainable revitalization strategies lies in their ability to cultivate economic resilience, provide a foundation for sustained job growth and reduced unemployment rates, and preserve MGT's

historical and cultural legacy. Sustainable measures embedded in revitalization strategies such as responsible land and resource management have enduring environmental impacts, benefiting residents and future generations.

MGTs that successfully integrate sustainability into their revitalization strategies can emerge as leaders in sustainable tourism practices, inspiring other communities to embark on similar journeys, and fostering a broader movement toward sustainable heritage tourism.

12. Future Trends and Recommendations

Several transformational themes are expected in the growing environment of MGT heritage tourism, altering how these historical places interact with tourists. Sustainability will be prioritized, emphasizing environmentally friendly practices and responsible tourism. Visitors' experiences will be enhanced by technological innovations such as augmented reality and digital storytelling. Because of distant work patterns, there will be an increasing desire for true cultural contacts, educational programs, and lengthier

stays. Policy-makers, stakeholders, and tourism practitioners are encouraged to engage in long-term planning linked with sustainability goals to strengthen these communities. It is critical to invest in historically sensitive infrastructure, as well as maintain community engagement and educational

activities. Sustainable practices, offering variety, partnership with neighboring communities, and tourist feedback methods are essential. Incentives for preservation, efficient marketing, and data-driven decision-making are all underlined (refer to Figures 3 and 4).



Figure 3. Future trends in mining ghost town heritage tourism.



Figure 4. Recommendations for Policy-makers, community stakeholders, and heritage tourism practitioners

MGT may become lively, sustainable, and culturally rich destinations by adopting these trends and ideas, conserving heritage, improving economic well-being, and assuring cultural vitality for future generations.

13. Conclusions

The study emphasizes the transformational impact of historical tourism in revitalizing MGT, focusing on sustainability and preservation. Prioritizing cultural preservation not only provides economic advantages by diversifying local economies, but it also secures these communities' long-term financial security. Heritage tourism

builds community pride and significant cultural legacies by conserving historical authenticity and cultural value, creating a strong awareness of identity and belonging among inhabitants and tourists. Sustainability considerations like environmental stewardship and community participation are critical to revival programs' success. Responsible land and resource management safeguards natural environments, protecting the safety of residents and future visitors. Heritage tourism educational programs help to establish culturally conscious communities and bridge the gap between the past and the present. Figure 5 depicts the conceptual introduction of heritage tourism in MGTs.

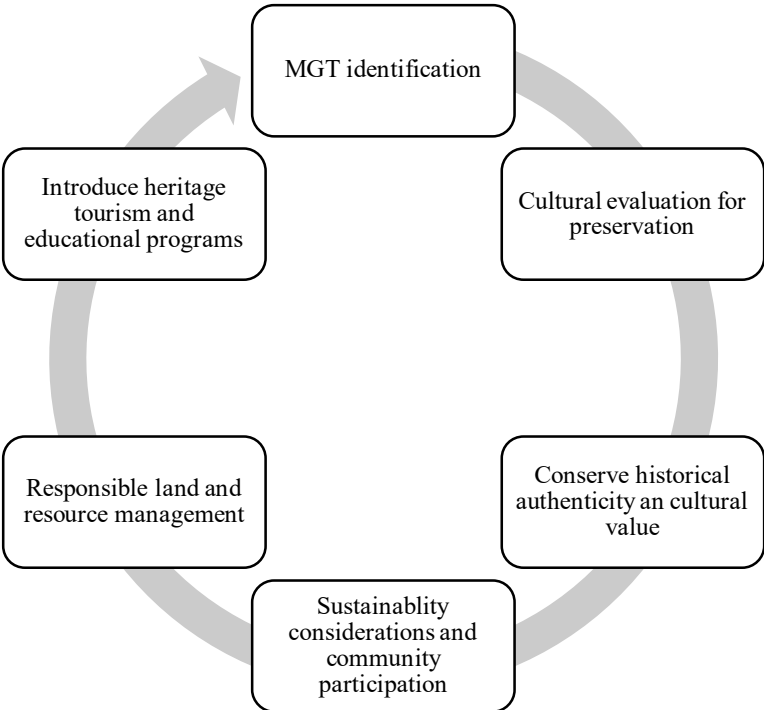


Figure 5. Conceptual process of introducing heritage tourism in MGTs.

MGT is positioned as a sustainable tourist destination through responsible tourism practices and sustainability activities, drawing visitors year-round and generating continuous cash streams. This accomplishment highlights heritage tourism's potential as a global example of responsible tourism, supporting economic growth, cultural preservation, and environmental protection. The importance of heritage tourism in revitalizing MGTs rests in maintaining historical and cultural legacies, supporting economic growth, pushing ethical tourist practices, and developing dynamic, sustainable destinations. This study establishes a paradigm for incorporating sustainability into heritage preservation by demonstrating the

peaceful coexistence of responsible tourist practices with cultural conservation. It shows how historical preservation and tourism may generate meaningful experiences, sustainable economies, and local and global cultural legacies.

This study explores the history, culture, and economic significance of MGTs, offering a comprehensive analysis of their complexities. It provides a theoretical framework for understanding heritage tourism and revitalization strategies, emphasizing historical authenticity, cultural diversity, and sustainable preservation. The study contributes to understanding responsible heritage management and the delicate balance between tourism and preservation. From a managerial

perspective, it guides heritage tourism practitioners, emphasizing community engagement, educational experiences, and sustainable branding. The study also emphasizes the importance of collaboration with sustainable travel agencies and responsible tourism practices. Future research could explore heritage tourism initiatives' long-term economic and social impacts. The study offers a blueprint for revitalizing MGTs. It opens avenues for further exploration, ensuring these sites continue to bridge the past with the present while fostering sustainable heritage tourism practices.

References

- [1]. Ghosh, P. (2021). Mining Tourism Potential Assessment of Raniganj Coalfield, India. *Advances in Hospitality and Tourism Research*, 9(2), 341-367.
- [2]. Li, Y., Chen, L., and Wen, H. (2015). Changes in the composition and diversity of bacterial communities 13 years after soil reclamation of abandoned mine land in eastern China. *Ecological Research*, 30, 357-366.
- [3]. Bangian, A.H. *et al.* (2011b). Fuzzy analytical hierarchy processing to define optimum post mining land use for pit area to clarify reclamation costs. *Mineral resources management (Gospodarka surowcami mineralnymi)*, 56(2), 145-168.
- [4]. Singh, R.S. and Ghosh, P. (2019). Potential of Mining Tourism: a Study of Select Coal Mines of Paschim Bardhaman District, West Bengal. *Indian Journal of Landscape Systems and Ecological Studies*, 42, 101-114. Retrieved from: https://www.researchgate.net/publication/344372938_POTENTIAL_OF_MINING_TOURISM_A_STUDY_OF_SELECT_COAL_MINES_OF_PASCHIM_BARDHAMAN_DISTRICT_WEST_BENGAL_INDIAN_JOURNAL_OF_LANDSCAPE_SYSTEM_AND_ECOLOGICAL_STUDIES.
- [5]. Singh, P.K. and Singh, R.S. (2016). Environmental and Social Impacts of Mining and their Mitigation. *National Seminar ESIMM-2016, Carbon sequestration through revegetated mine wasteland*.
- [6]. Pahlevan-Sharif, S., Mura, P., and Wijesinghe, S.N.R. (2019). A systematic review of systematic reviews in tourism. *Journal of Hospitality and Tourism Management*, 39, 158-165.
- [7]. Comerio, N. and Strozzi, F. (2019). Tourism and its economic impact: a literature review using bibliometric tools. *Tourism Economics*, 25(1), 109-131.
- [8]. Nilsson, C. *et al.* (2016). Evaluating the process of ecological restoration. *Ecology and Society*, 21(1), 1-18. DOI: 10.5751/ES-08289-210141.
- [9]. Zhang, S. *et al.* (2023). Research on global cultural heritage tourism based on bibliometric analysis. *Heritage Science*, 11(1:139).
- [10]. Lee, C.K. *et al.* (2023). Sustainable intelligence and cultural worldview as triggers to preserve heritage tourism resources. *Tourism Geographies*, 25(2-3), 899-918.
- [11]. Sousa, J.J. *et al.* (2023). Using machine learning and satellite data from multiple sources to analyze mining, water management, and preservation of cultural heritage. *Geo-spatial Information Science*, 1-20.
- [12]. Shen, Y., Li, Y., and Li, Z. (2022). Application of intelligent inspection robot in coal mine industrial heritage landscape: Taking Wangshiwa coal mine as an example. *Frontiers in Neurorobotics*, 16(865146).
- [13]. Kuter, N. (2013). Reclamation of Degraded Landscapes due to Opencast Mining. *Advances in Landscape Architecture, Rijeka, Croatia, InTech*, 823-858.
- [14]. Winkler, R. *et al.* (2016). Boom, bust and beyond: Arts and sustainability in Calumet, Michigan. *Sustainability*, 8(3), 284.
- [15]. Loureiro, S.M.C. *et al.* (2022). Culture, heritage looting, and tourism: A text mining review approach. *Frontiers in Psychology*, 13(944250).
- [16]. Chark, R. (2021). Midnight in Paris: On heritage and nostalgia. *Annals of Tourism Research*, 90(103266).
- [17]. Lee, Y.J. (2023). Destination fascination, well-being, and the reasonable person model of behavioural intention in heritage tourism. *Current Issues in Tourism*, 1-17.
- [18]. Bainton, N. and Holcombe, S. (2018). A critical review of the social aspects of mine closure. *Resources Policy*, 59, 468-478.
- [19]. Acquah, P.C. and Boateng, A. (2008). Planning for mine closure: Some case studies in Ghana. *Minerals & Energy - Raw Materials Report*, 15(1), 23-30.
- [20]. Siyongwana, P.Q. and Shabalala, A. (2018). The socio-economic impacts of mine closure on local communities: evidence from Mpumalanga Province in South Africa. *GeoJournal*, 84, 367-380.
- [21]. Dudley, N. *et al.* (2018). Measuring progress in status of land under forest landscape restoration using abiotic and biotic indicators. *Soc. Ecol. Restor*, 26(1), 5-12.
- [22]. Hashimoto, A. and Telfer, D.J. (2017). Transformation of Gunkanjima (Battleship Island): From a coalmine island to a modern industrial heritage tourism site in Japan. *Journal of Heritage Tourism*, 12(2), 107-124.

- [23]. Peng, K.H. and Tzeng, G.H. (2019). Exploring heritage tourism performance improvement for making sustainable development strategies using the hybrid-modified MADM model. *Current issues in tourism*, 22(8), 921-947.
- [24]. Luo, P., Miao, Y., and Chang, J. (2020). The "Classification - Strategies" method for the eco-transition of "mine-city" system-taking Xuzhou city as an example. *Journal of Urban Management*, 9(3), 360-371.
- [25]. Skousen, J.G., Ziemkiewicz, P.F., and McDonald, L.M. (2019). Acid mine drainage formation, control and treatment: Approaches and strategies. *The Extractive Industries and Society*, 6(1), 241-249.
- [26]. Meyfroidt, P. *et al.* (2018). Middle-range theories of land system change. *Global Environmental Change*, 53, 52-67.
- [27]. Ellis, E.C. (2021). Land Use and Ecological Change: A 12,000-Year History. *Annual Review of Environment and Resources*, 46, 1-33.
- [28]. Xu, Y. *et al.* (2020). Towards sustainable heritage tourism: A space syntax-based analysis method to improve tourists' spatial cognition in Chinese historic districts. *Buildings*, 10(2):29. <https://doi.org/10.3390/buildings10020029>.
- [29]. Carney, P.A. *et al.* (2012). Impact of a community gardening project on vegetable intake, food security and family relationships: a community-based participatory research study. *Journal of Community Health*, 37, 874-881.
- [30]. Kołodziej, B. *et al.* (2016). Soil physical properties of agriculturally reclaimed area after lignite mine: a case study from central Poland. *Soil and Tillage Research*, 163, 54-63.
- [31]. Brueckner, M. *et al.* (2021). Mining legacies—Broadening understandings of mining impacts. *The Extractive Industries and Society*, 8(3:100950).
- [32]. Mhlongo, S.E. and Amponsah-Dacosta, F. (2015). A review of problems and solutions of abandoned mines in South Africa. *International Journal of Mining, Reclamation and Environment*, 30(4), 279-294.
- [33]. Poursmaieli, M., Ataei, M., and Taran, A. (2023). Future mining based on internet of things (IoT) and sustainability challenges. *International Journal of Sustainable Development & World Ecology*, 30(2), 211-228.
- [34]. Mzembe, A.N., Koens, K., and Calvi, L. (2023). The institutional antecedents of sustainable development in cultural heritage tourism. *Sustainable Development*, 31(4), 2196-2211.
- [35]. Yang, W. *et al.* (2022). How do aesthetics and tourist involvement influence cultural identity in heritage tourism? The mediating role of mental experience. *Frontiers in Psychology*, 13(990030). <https://doi.org/10.3389/fpsyg.2022.990030>.
- [36]. Fernández-Vázquez, E. (2022). Mine closures and local diversification: Job diversity for coal-mining areas in a post-coal economy. *The Extractive Industries and Society*, 101086.
- [37]. Anawar, H.M. (2015). Sustainable rehabilitation of mining waste and acid mine drainage using geochemistry, mine type, mineralogy, texture, ore extraction and climate knowledge. *Journal of Environmental Management*, 158, 111-121.
- [38]. Dai, T.C., Zheng, X., and Yan, J. (2021). Contradictory or aligned? The nexus between authenticity in heritage conservation and heritage tourism, and its impact on satisfaction. *Habitat International*, 107(102307).
- [39]. Brooks, C. *et al.* (2023). Exploring the relationships between heritage tourism, sustainable community development and host communities' health and wellbeing: A systematic review. *PLoS One*, 18(3e0282319). <https://doi.org/10.1371/journal.pone.0282319>.
- [40]. Life in Quarries Project. (2017). Retrieved from: <http://www.lifeinquarries.eu/en/>.
- [41]. Tu, H.M. (2020). Sustainable heritage management: Exploring dimensions of pull and push factors. *Sustainability*, 12(19:8219).
- [42]. Tu, H.M. (2022). Confirmative biophilic framework for heritage management. *PLoS One*, 17(3:e0266113).
- [43]. Zhu, Y. (2021). Heritage tourism: from problems to possibilities. *International Journal of Heritage Studies*, 28(1), 127-129.
- [44]. Lin, Z. and Rasoolimanesh, S.M. (2023). Influencing factors on the intention of sharing heritage tourism experience in social media. *Journal of Hospitality and Tourism Technology*, 14(4), 675-700.
- [45]. Gallwey, J. *et al.* (2019). Bringing lunar LiDAR back down to earth: Mapping our industrial heritage through deep transfer learning. *Remote Sensing*, 11(17:1994).
- [46]. Huang, L. and Song, Y. (2022). Intangible Cultural Heritage Management Using Machine Learning Model: A Case Study of Northwest Folk Song Huaer. *Scientific Programming*, 2022(1383520).
- [47]. Liu, X. *et al.* (2022). Cultural Heritage Resource Development and Industrial Transformation Resource Value Assessment based on BP Neural Network. *Computational Intelligence and Neuroscience*, 2022. DOI: 10.1155/2022/2288358.
- [48]. Ibănescu, B.C. *et al.* (2018). The Impact of Tourism on Sustainable Development of Rural Areas: Evidence from Romania. *Sustainability*, 10(10:3529).

- [49]. Singh, A.N., Srinivas, M., and Naik, B.N. (2015). Forecasting the impact of surface mining on surrounding cloud computing. *Journal of Computer Sciences and Applications*, 3(6), 118-122. DOI:10.12691/jcsa-3-6-1.
- [50]. Poulsen, M.N., Neff, R.A., and Winch, P.J. (2017). The multi-functionality of urban farming: perceived benefits for neighbourhood improvement. *The International Journal of Justice and Sustainability*, 22(11), 1411-1427.
- [51]. Garcês, S., Pocinho, M., and Jesus, S.N.D. (2018). Review of optimism, creativity and spirituality in tourism research. *Tourism and Hospitality Management*, 24(1), 107-117. DOI:10.20867/thm.24.L6.
- [52]. Wijesinghe, S.N.R., Mura, P., and Bouchon, F. (2017). Tourism knowledge and neo-colonialism: A systematic critical review of the literature. *Current Issues in Tourism*, 22(11), 263-1279.
- [53]. Chabukdhara, M. and Singh, O.P. (2016). Coal mining in northeast India: an overview of environmental issues and treatment approaches. *International Journal of Coal Science & Technology*, 3, 87-96.
- [54]. Venkateswarlu, K. *et al.* (2016). Abandoned metalliferous mines: ecological impacts and potential approaches for reclamation. *Rev Environ Sci Biotechnol*, 15(2), 327-354.
- [55]. Agboola, O. *et al.* (2020). A review on the impact of mining operation: Monitoring, assessment and management. *Results in Engineering*, 8(100181).
- [56]. Różycki, P. and Dryglas, D. (2017). Mining tourism, sacral and other forms of tourism practiced in antique mines - analysis of the results. *Acta Montanistica Slovaca*, 22(1), 58-66. Retrieved from: https://www.researchgate.net/publication/317163871_Mining_tourism_sacral_and_other_forms_of_tourism_practiced_in_antique_mines_-_Analysis_of_the_results.
- [57]. McCullough, C.D., Schultze, M., and Vandenberg, J. (2020). Realizing Beneficial End Uses from Abandoned Pit Lakes. *Minerals*, 10(2):133.
- [58]. Lagarensse, B.E.S. and Walansendow, A. (2014). Exploring Residents' Perceptions and Participation on Tourism and Waterfront Development: The Case of Manado Waterfront Development in Indonesia. *Asia Pacific Journal of Tourism Research*, 20(2), 223-237.
- [59]. Vaugeois, N. *et al.* (2009). "Made in BC" Innovation in Sustainable Tourism. *Fostering Innovation in Sustainable Tourism*. DOI: 10.13140/RG.2.2.34237.36323, Retrieved from: <https://web.viu.ca/sustainabletourism/Innovation%20annual%20Final%20June%204.pdf>.
- [60]. Blanchette, M.L. and Lund, M.A. (2016). Pit lakes are a global legacy of mining: an integrated approach to achieving sustainable ecosystems and value for communities. *Current Opinion in Environmental Sustainability*, 23, 28-34.
- [61]. Wapwera, S.D., Ayanbimpe, G.M., and Odita, C.E. (2015). Abandoned mine, potential home for the people: a case study of Jos Plateau Tin-Mining Region. *Journal of Civil Engineering and Architecture*, 9, 429-445.
- [62]. Hu, Z., Wang, P., & Li, J. (2012). Ecological Restoration of Abandoned Mine Land in China. *Journal of Resources and Ecology*, 3(4), 289-296.
- [63]. Li, Y., Chen, L., and Wen, H. (2014). Changes in the composition and diversity of bacterial communities 13 years after soil reclamation of abandoned mine land in eastern China. *Ecological Research*, 30, 357-366.
- [64]. George-Laurentiu, M., Florentina-Cristina, M., and Andreea-Loreta, C. (2016). The Assessment of Social and Economic Impacts Associated to an Abandoned Mining Site Case study: Ciudanovita (Romania). *Procedia Environmental Sciences*, 32, 420-430.
- [65]. Kim, A. (2011). Chapter 16 - United States Bureau of Mines-Study and Control of Fires in Abandoned Mines and Waste Banks. *Coal and Peat Fires: A Global Perspective*, 1, 267-305.
- [66]. Mwakesi, I., Wahome, R., and Ichang, D. (2020). Mining impact on communities' livelihoods: A case study of Taita Taveta County, Kenya. *AIMS Environmental Science*, 7(3), 286-301.
- [67]. Vrablikova, J., Wildova, E., and Vrablik, P. (2016). Sustainable Development and Restoring the Landscape after Coal Mining in the Northern Part of the Czech Republic. *Journal of Environmental Protection*, 7(11).
- [68]. Kasztelewicz, Z. (2014). Approaches to Post-Mining Land Reclamation in Polish Open-Cast Lignite Mining. *Civil and Environmental Engineering Reports*, 12(1), 55-67.
- [69]. Cao, X. (2007). Regulating Mine Land Reclamation in Developing Countries: The Case of China. *Land Use Policy*, 24(2), 472-483.
- [70]. Velan, M., & Prasad, M.N.V. (2018). Chapter 20 - Neyveli Lignite Mine Waste Rehabilitation for Sustainable Development. *Bio-Geotechnologies for Mine Site Rehabilitation*, 347-370.
- [71]. Larsen, R.K. *et al.* (2022). The impacts of mining on Sámi lands: A knowledge synthesis from three reindeer herding districts. *The Extractive Industries and Society*, 9(101051).
- [72]. Singh, R.S. and Ghosh, P. (2021). Geotourism potential of coal mines: An appraisal of Sonapur-Bazari open cast project, India. *International Journal of Geoheritage and Parks*, 9(2), 172-181.

- [73]. UAK. (2017). University of Agriculture in Krakow: Current challenges in reclamation to forest. Retrieved from: <http://reclamation2016.ur.krakow.pl/>.
- [74]. Jurek, V. (2014). Wildlife return at the quarry "Břidla": possibilities of natural habitat restoration. Czech Republic, Brno, Quarry Life Award Project. Retrieved from: <https://www.slideshare.net/QuarryLifeAward/wildlife-return-at-the-quarry-bidla-possibilities-of-natural-habitat-restoration-by-vilm-jurek-czech-republic>.
- [75]. Havrlant, J. and Krtička, L. (2014). Reclamation of devastated landscape in the Karviná region (Czech Republic). *Environmental & Socio-economic Studies*, 2(4), 1–12.
- [76]. Orewere, E., Owonubi, A., and Zainab, S. (2020). Landscape Reclamation for Abandoned Mining Site for Outdoor Recreation on the Jos Plateau. *Journal of Environmental Sciences and Resources Management*, 12(2), 26-50. Retrieved from: <https://www.researchgate.net/publication/350190399>
LANDSCAPE RECLAMATION FOR
ABANDONED MINING SITE FOR OUTDOOR
RECREATION ON THE JOS PLATEAU.
- [77]. Yang, E.C.L., Khoo-Lattimore, C., and Arcodia, C. (2017). A systematic literature review of risk and gender research in tourism. *Tourism Management*, 58, 89-100.
- [78]. Siddaway, A.P., Wood, A.M., and Hedges, L.V. (2019). How to Do a Systematic Review?: a Best Practice Guide for Conducting and Reporting Narrative Reviews, Meta-Analyses, and Meta-Syntheses. *Annual Review of Psychology*, 70, 747-770.
- [79]. Nag, A. and Mishra, S. (2023). Stakeholders' perception and competitiveness of heritage towns: A systematic literature review. *Tourism Management Perspectives*, 48(101156).
- [80]. Heymans, A. *et al.* (2019). Ecological Urban Planning and Design: a Systematic Literature Review. *Sustainability*, 11(13).
- [81]. Eusébio, C. *et al.* (2021). The impact of air quality on tourism: a systematic literature review. *Journal of Tourism Futures*, 7(1), 111-130.
- [82]. Kim, C. S. *et al.* (2018). Review of reviews: A systematic analysis of review papers in the hospitality and tourism literature. *International Journal of Hospitality Management*, 70, 49–58.
- [83]. Janjua, Z.A., Krishnapillai, G., and Rahman, M. (2021). A Systematic Literature Review of Rural Homestays and Sustainability in Tourism. *SAGE Open*, 11(2).
- [84]. Macías, F. *et al.* (2017). A geochemical approach to the restoration plans for the Odiel River basin (SW Spain), a watershed deeply polluted by acid mine drainage. *Environ Sci Pollut Res*, 24, 4506–4516.
- [85]. Pouresmaeli, M. *et al.* (2022). Recent progress on sustainable phytoremediation of heavy metals from soil. *Journal of Environmental Chemical Engineering*, 10(5):108482).
- [86]. Narrei, S. and Osanloo, M. (2011). Post-Mining Land-Use Methods Optimum Ranking, using Multi-attribute Decision Techniques with Regard to Sustainable Resources Management. *OIDA International Journal of Sustainable Development*, 2(11), 65-76. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1981431#.
- [87]. Zasada, I. (2011). Multifunctional peri-urban agriculture—A review of societal demands and the provision of goods and services by farming. *Land Use Policy*, 28(4), 639-648.
- [88]. Mastrogianni, A. *et al.* (2014). Reclamation of lignite mine areas with Triticum aestivum: the dynamics of soil functions and microbial communities. *Applied Soil Ecology*, 80, 51–59.
- [89]. Alavi, I., Ebrahimabadi, A., and Hamidian, H. (2022). A New Technical and Economic Approach to Aptimal Plant Species Selection for Open-pit Mine Reclamation Process. *Journal of Mining and Environment*, 13(4), 1091-1105.
- [90]. Szczepiński, J. *et al.* (2010). Reclamation of polish lignite open pits by flooding. *Biuletyn Państwowego Instytutu Geologicznego*, 441(441), 167–174. Retrieved from: <https://geojournals.pgi.gov.pl/bp/article/view/28887>.
- [91]. Esch, M. (2016). Hydroelectric engineers find potential in centuries-old mine. *Energy & Green Tech.* Retrieved from: <https://phys.org/news/2016-12-hydroelectric-potential-centuries-old.html>.
- [92]. Šebelíková, L., Řehounková, K., and Prach, K. (2016). Spontaneous revegetation vs. forestry reclamation in post-mining sand pits. *Environmental Science and Pollution Research*, 23, 13598–13605.
- [93]. Kim, A.R. *et al.* (2021). Principle of restoration ecology reflected in the process creating the National Institute of Ecology. *Journal of Ecology and Environment*, 45(12).
- [94]. Bing-yuan, H. and Li-xun, K. (2014). Mine Land Reclamation and Eco-Reconstruction in Shanxi Province I: Mine Land Reclamation Model. *The Scientific World Journal*, 2014(483862).
- [95]. Zobrist, J. *et al.* (2009). Environmental and socioeconomic assessment of impacts by mining activities—a case study in the Certej River catchment, Western Carpathians, Romania. *Environmental Science and Pollution Research*, 16, 14–26.
- [96]. Macdonald, S.E. *et al.* (2015). Forest restoration following surface mining disturbance: challenges and solutions. *New Forests*, 46, 703–732.

- [97]. Zhuang, X., Yao, Y., and Li, J. (2019). Sociocultural Impacts of Tourism on Residents of World Cultural Heritage Sites in China. *Sustainability*, 11(3:840).
- [98]. Zhao, Z. and Liu, Z. (2021). Development Path of Industrial Heritage Tourism: A Case Study of Kitakyushu (Japan). *Sustainability*, 13(21:12099).
- [99]. Gilewska, M. and Otremba, K. (2015). Water reservoirs under construction as a result of the activities of “Konin” and “Adamów” brown coal mines. *Journal of Ecological Engineering*, 16(5), 138–143.
- [100]. Xiao, W. *et al.* (2011). A study of land reclamation and ecological restoration in a resource-exhausted city – a case study of Huaibei in China. *International Journal of Mining, Reclamation and Environment*, 25(4), 332-341.
- [101]. Yu, X., Mu, C., and Zhang, D. (2020). Assessment of Land Reclamation Benefits in Mining Areas Using Fuzzy Comprehensive Evaluation. *Sustainability*, 12(5).
- [102]. Spyridou, L.P. (2019). Analysing the active audience: Reluctant, reactive, fearful, or lazy? Forms and motives of participation in mainstream journalism. *Journalism*, 20(6), 827-847.
- [103]. Scarpi, D. and Raggiotto, F. (2023). A construal level view of contemporary heritage tourism. *Tourism Management*, 94(104648). <https://doi.org/10.1016/j.tourman.2022.104648>.
- [104]. Angel, P.N. *et al.* (2009). The Forestry Reclamation Approach and the Measure of its Success in Appalachia 1. *Journal of the American Society of Mining and Reclamation*, 18-36.
- [105]. Tretiak, V.M. and Marchenkova, T.P. (2020). Recreational land use: issues of development and assessment of potential. *Land management, cadastre, and land monitoring*, 26(1).
- [106]. Pouresmaieli, M., Ataei, M., and Qarahasanlou, A. N. (2023). A scientometrics view on sustainable development in surface mining: Everything from the beginning. *Resources Policy*, 82(103410).
- [107]. Deery, M., Jago, L., and Fredline, L. (2012). Rethinking social impacts of tourism research: a new research agenda. *Tourism Management*, 33(1), 64-73.
- [108]. McKercher, B. and Ho, P.S.Y. (2011). Assessing the Tourism Potential of Smaller Cultural and Heritage Attractions. *Journal of Sustainable Tourism*, 14(5), 473-488.
- [109]. Seifullina, A. *et al.* (2018). A Lean Implementation Framework for the Mining Industry. *IFAC-PapersOnLine*, 51(11), 1149-1154.
- [110]. Roberts, S. and Tribe, J. (2008). Sustainability Indicators for Small Tourism Enterprises – an Exploratory Perspective. *Journal of Sustainable Tourism*, 16(5), 575-594.
- [111]. Rayel, J.J., Manoka, B., and Boin, C. (2012). Residents’ Perception on the Implications of Tourism and the Proposed Mining Operations along Kokoda Track in Papua New Guinea. *International Journal of Tourism Sciences*, 12(1), 69-92.
- [112]. Bangian, A.H., *et al.* (2011a). The Application of Fuzzy MADM Modelling to Define Optimum Post Mining Land Use for Pit Area to Recognize Reclamation Costs in Open-Pit Mining. *Archives of Mining Science*, 56(1), 91–116.
- [113]. Hajkazemiha, N. *et al.* (2021). Evaluation of Mine Reclamation Criteria Using Delphi-Fuzzy Approach. *Journal of Mining and Environment*, 12(2), 367-384.
- [114]. Wirth, P. *et al.* (2018). Green infrastructure: a planning concept for the urban transformation of former coal-mining cities. *International Journal of Coal Science & Technology*, 5, 78–91.
- [115]. Zhang, J. *et al.* (2011). Land Use-based Landscape Planning and Restoration in Mine Closure Areas. *Environmental Management*, 47, 739–750.
- [116]. Saigustia, C. and Robak, S. (2021). Review of Potential Energy Storage in Abandoned Mines in Poland. *Energies*, 14(19:6272).
- [117]. Jelen, J. (2018). Mining Heritage and Mining Tourism. *Czech Journal of Tourism*, 7(1), 93-105.
- [118]. Tian, P. *et al.* (2021). Impacts of reclamation derived land use changes on ecosystem services in a typical gulf of eastern China: A case study of Hangzhou bay. *Ecological Indicators*, 132(108259).
- [119]. Sihem, E. (2019). Economic and socio-cultural determinants of agricultural insurance demand across countries. *Journal of the Saudi Society of Agricultural Sciences*, 18(2), 177-187.
- [120]. Diekmann, L.O., Gray, L.C., and Thai, C.L. (2020). More than Food: the Social Benefits of Localized Urban Food Systems. *Front. Sustain. Food Syst.*, 4(534219).
- [121]. Brehm, J.M. and Eisenhauer, B.W. (2008). Motivations for Participating in Community-Supported Agriculture and their Relationship with Community Attachment and Social Capital. *Journal of Rural Social Sciences*, 23(1). <https://egrove.olemiss.edu/jrss/vol23/iss1/5>.
- [122]. Adesipo, A.A. *et al.* (2021). An Approach to Thresholds for Evaluating Post-Mining Site Reclamation. *Sustainability*, 13(10:5618).
- [123]. Lynch, A.J. *et al.* (2016). The social, economic, and environmental importance of inland fish and fisheries. *Environmental Reviews*, 24(2), 115-121.
- [124]. Favas, P.J.C., Martino, L.E., and Prasad, M.N.V. (2018). Chapter 1 - Abandoned Mine Land Reclamation—Challenges and Opportunities (Holistic

Approach). *Bio-Geotechnologies for Mine Site Rehabilitation*, 3-31.

[125]. Sheoran, V., Sheoran, A.S., and Poonia, P. (2010). Soil Reclamation of Abandoned Mine Land by Revegetation: A Review. *International Journal of Soil, Sediment and Water*, 3(2). Retrieved from: <https://scholarworks.umass.edu/intljssw/vol3/iss2/13>.

[126]. Centobelli, P. and Ndou, V. (2019). Managing customer knowledge through the use of big data analytics in tourism research. *Current Issues in Tourism*, 1(15), 1862-1882.

[127]. Das, S.K., Mahamaya, M., and Reddy, K. R. (2020). Coal mine overburden soft shale as a controlled low strength material. *International Journal of Mining, Reclamation and Environment*, 34(10), 725-747.

[128]. Singh, G. *et al.* (2020). Soil pollution by fluoride in India: distribution, chemistry and analytical methods. *Environmental Concerns and Sustainable Development*, 307-324.

[129]. Li, D., Du, P., and He, H. (2022). Artificial Intelligence-based Sustainable Development of Smart Heritage Tourism. *Wireless Communications & Mobile Computing*, 5441170.

[130]. Tsai, S.P. (2020). Augmented reality enhancing place satisfaction for heritage tourism

marketing. *Current Issues in Tourism*, 23(9), 1078-1083.

[131]. Shafaei, F. and Mohamed, B. (2015). A Stage-based Model Development Study on Tourism Social Impact Assessment. *International Journal of Scientific and Research Publications*, 5(3), 1-6. Retrieved from: <https://www.ijsrp.org/research-paper-0315/ijsrp-p3942.pdf>.

[132]. Almeyda-Ibáñez, M. and George, B.P. (2017). The evolution of destination branding: A review of branding literature in tourism. *Journal of Tourism, Heritage & Services Marketing*, 3(1), 9-17.

[133]. Zhu, P. *et al.* (2022). Traveller pro-social behaviours at heritage tourism sites. *Frontiers in Psychology*, 13(901530).

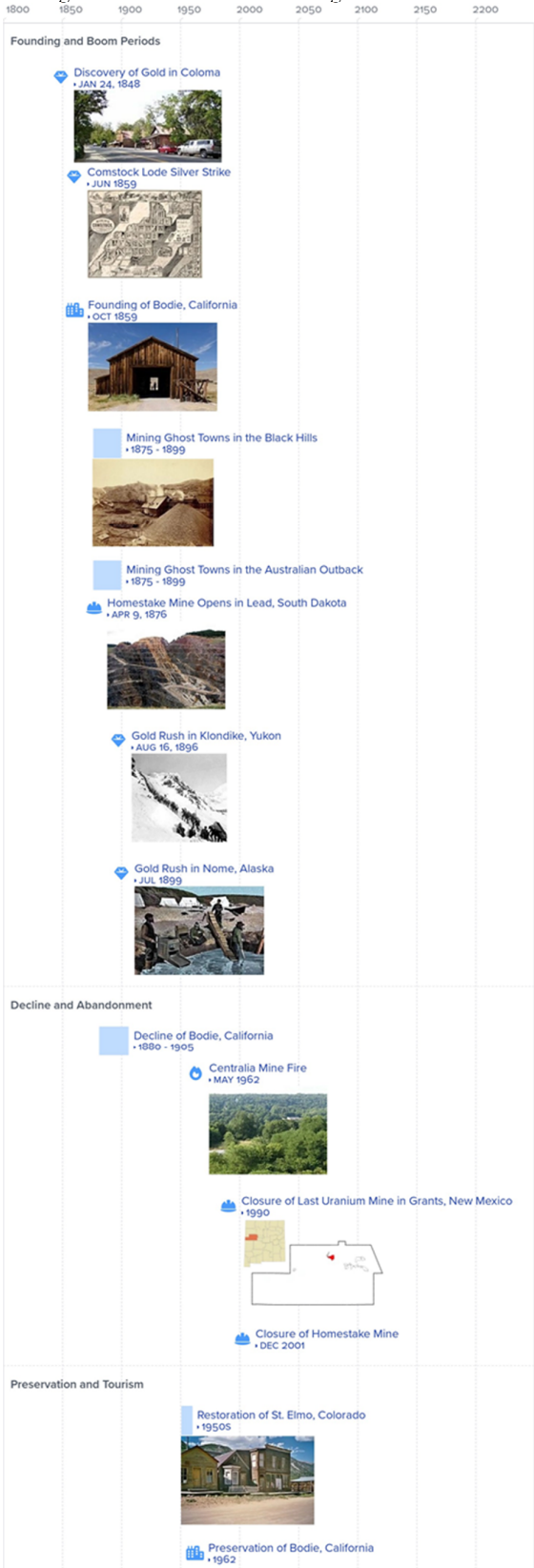
[134]. Jiang, S. *et al.* (2023). Augmented reality and the enhancement of memorable tourism experiences at heritage sites. *Current Issues in Tourism*, 26(2), 242-257.

[135]. Dickinson, J.E. (2015). Travel, tourism, climate change, and behavioural change: travellers' perspectives from a developing country, Nigeria. *Journal of Sustainable Tourism*, 23(3), 437-454.

[136]. García, F.A., Vázquez, A.B., and Macías, R.C. (2015). Resident's attitudes towards the impacts of tourism. *Tourism Management Perspectives*, 13, 33-40.

Appendix A

Figure 6: Timeline of historical significance of MGT



احیای شهر ارواح معدن از طریق ابتکارات گردشگری میراث

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چکیده:

این مطالعه احیای شهرهای ارواح معدن (MGTs) را از طریق گردشگری میراث، با تمرکز بر پایداری و حفظ میراث بررسی می کند. این مطالعه پتانسیل تحول آفرین گردشگری میراث را در احیای این شهرها برجسته می کند و انعطاف پذیری اقتصادی حاصل از اقتصادهای محلی متنوع و شیوه های گردشگری مسئولانه را برجسته می کند. حفاظت از فرهنگ، ماندگاری هویت های منحصربه فرد و میراث فرهنگی را تضمین می کند و باعث غرور جامعه و تبادل فرهنگی می شود. اقدامات پایداری فراتر از حفاظت از میراث، ترویج نظارت بر محیط زیست و رفاه زیست محیطی بلند مدت است. مشارکت جامعه، ابتکارات آموزشی، و شیوه های گردشگری مسئولانه در حفظ میراث این شهرها بسیار مهم است. پیامدها فراتر از جوامع فردی گسترش می یابد و الگویی برای فعالیت های گردشگری مسئولانه و پایدار با ارتباط جهانی ارائه می دهد. اهمیت احیای MGT ها از طریق گردشگری میراث در حفظ تاریخ، توانمندسازی جوامع و ایجاد مقاصد پر جنب و جوش و پایدار برای نسل ها نهفته است.

کلمات کلیدی: گردشگری میراث، شهرهای ارواح معدن، احیا، مزیت رقابتی پایدار، حفاظت از فرهنگ.