



Examining the potential for development of sustainable mining tourism in a fading mining town: A case study of Arandis — Namibia

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ABSTRACT

Purpose of the Study: Arandis, a mining town in Namibia, saw substantial economic growth due to uranium mining. This research evaluates the potential for establishing sustainable tourism as a niche economic activity in this town, which is experiencing economic decline, using Arandis as a case study. A similar study was carried out in Oranjemund to explore whether mining towns could spur local economic growth through diversification. This approach is essential, given that former mining towns like Elizabeth Town have turned into "ghost towns" following mine closures and lack of alternative economic activities.

Design/methodology/approach: The study utilized qualitative research methods, including data collection from company reports, prior research, in-depth interviews, case studies, and surveys. The sample consisted of 25 key stakeholders, such as business owners and town council members, who are crucial to the town's economic development. Thematic content analysis was applied to assess the experiences and opinions of these participants.

Findings: The findings, detailed in a narrative report and cross-referenced with historical literature, show that Arandis is not entirely dependent on mining. The town council is actively pursuing other economic avenues, such as construction, solar energy, fishing, and manufacturing. However, tourism is still limited.



Recommendation/value: To achieve sustainable mining, the town needs to integrate tourism with other resilient and sustainable economic activities, a strategy that has succeeded in other mining towns globally.

Managerial Implications: The study's insights are valuable for contemporary management, emphasizing the importance of diversification, sustainability, stakeholder engagement, and strategic planning in managing economic transitions. These findings can help managers effectively navigate the challenges of declining industries and promote long-term economic resilience.

Keywords

Sustainable mining tourism; sustainable tourism; sustainable tourism development; tangible and intangible mining heritage

JEL Classification: Z3

1. INTRODUCTION

Arandis is a town where development and growth are dominated by mining; hence, mining is the only reliable source of economic development. Arandis is located in the touristic Erongo region, where Rio Rössing mining became the first commercial mine to secure uranium mining rights in Namibia since 1976. The mine is located 12 km from the town of Arandis. Over the past 44 years, the mine has been the only source of employment, economic stability, and infrastructural development in Arandis (Van der Merwe *et al.*, 2011).

Although mining is a profitable economic activity, it is a non-renewable resource that does not guarantee sustainable economic development. Therefore, the closure of mines can lead to various negative impacts, such as economic decline, unemployment, workforce migration and, eventually, urban decline. This study suggests that once mining is no longer profitable, sustainable mining tourism can be developed as an alternative sustainable economic activity that would ensure a new means of economic development and regeneration of the area. Van der Merwe *et al.* (2011) contended that fading mining towns could utilise tourism as a novel form of economic activity to rejuvenate the economy and infrastructure and create employment in the new sector of tourism.

The goal of this research, therefore, is to further explore various opportunities for developing mining tourism in the fading mining town of Arandis. This will provide an alternative sustainable economic activity, which will allow economic diversification aimed at reducing overreliance on a single industry. Moreover, alternative economic diversity will provide the town with opportunities to develop community resilience and prosperity.

2. LITERATURE REVIEW

The literature review highlights the importance of sustainable tourism development in fading mining towns and the potential of mining tourism to become a catalyst for economic revitalisation and heritage preservation. By drawing on theoretical frameworks and case studies, this chapter provides a foundation for understanding the context, challenges, and opportunities associated with the proposed case study in Arandis, Namibia. The subsequent chapters will build upon this literature review, so as to analyse the feasibility and implications of developing sustainable mining tourism in Arandis.

2.1 Mining tourism

Mining tourism, which encompasses a variety of definitions and perspectives, is often referred to as sustainable mining tourism, predicated on its ability to adopt sustainable tourism principles. Kršák *et al.* (2015) characterised this form of tourism as being capable of blending industrial, technological, cultural, and ethnographic heritage while offering visitors a cognitive-educational-experience-oriented journey. Similarly, Rózycki and Dryglas (2017) perceived mining tourism as any tourist activity occurring in industrial, technological, or industrial heritage sites, meticulously curated to become part of destination tourist offerings.

Historically, mining has been associated with negative social impacts on communities (Buultjens *et al.*, 2010). However, when integrated with tourism — leveraging the historical significance of mining landscapes — the adverse effects can be mitigated to some extent. Mining tourism has emerged as a facet of sustainable tourism, facilitating the preservation of community social legacies and the transformation of industrial areas into heritage attractions (Dimitrovski & Senic, 2019). This sustainable development hinges on creating a delicate balance of economic, social, cultural, and environmental considerations to minimise negative impacts and maximise benefits for both visitors and host communities.

Maksimović *et al.* (2016) posited that mining tourism not only fosters tourism development but also contributes to the integrated and sustainable development of regions. Consequently, in countries with well-established tourism services, there is a growing emphasis on mining tourism development (Brouder, 2014).

2.2 Mining tourism: A component of sustainable tourism

Mining tourism, often referred to as industrial tourism or heritage tourism, is an integral component of sustainable tourism initiatives. While originating from the broader principles of sustainable tourism, mining tourism aims to utilise the historical significance and industrial heritage of mining towns to drive economic revitalisation and preserve heritage. Furthermore, sustainable tourism endeavours to minimise adverse impacts on the environment, culture, and local communities while maximising the economic benefits of mining tourism by specifically focusing on the unique heritage and industrial landscapes associated with mining activities (Stoddard *et al.*, 2012).

Within the sustainable tourism framework, mining tourism embodies a holistic approach that encompasses economic viability, environmental conservation, mutual socio-cultural respect, community engagement, and responsible tourism practices (United Nations World Tourism Organization [UNWTO] 2020). Advocates of sustainable tourism view mining tourism as an effective vehicle for economic growth, community empowerment, and tourism development that is economically viable, environmentally sustainable, and socially acceptable (Food and Agriculture Organization [FAO] 2016). By embracing these principles, mining tourism aims to create positive opportunities for the future while preserving the rich heritage and cultural identity of mining regions (Begum, 2021).

Various frameworks and strategies have been devised as a guide for the implementation of sustainable tourism practices, including methods tailored to mining tourism. These frameworks stress the importance of balancing economic prosperity, environmental stewardship, and socio-cultural well-being to achieve sustainable tourism development (Liu, 2003). Key components include stakeholder engagement and participation, capacity building and education, resource management and conservation, as well as quality experiential tourism development. Through these components, mining tourism seeks to create shared value for tourists, local communities, businesses, and other stakeholders while ensuring the long-term sustainability, resilience, and prosperity of mining regions (Janusz & Bajdor, 2013). Mining tourism, when developed and managed with careful *consideration of economic*, social, cultural, and environmental factors, embodies sustainable tourism principles (Buultjens *et al.*, 2010). Moreover, this type of focused integration supports several dimensions of sustainability, namely:

Economic sustainability: Mining tourism plays a vital role in local economic development by creating employment opportunities, fostering revenue generation for local businesses, and diversifying the economy of mining regions. By attracting tourists to lesser-visited areas and

emphasising the preservation of mining heritage, it naturally stimulates local economies and facilitates community development.

Social and cultural sustainability: By offering opportunities for visitors to delve into the history, culture, and heritage of mining communities, mining tourism nurtures a more profound appreciation for the cultural significance of mining activities and traditions (Dimitrovski & Senic, 2019). Additionally, through engagement with local residents and participation in tourism-related activities, visitors contribute to cultural heritage preservation while promoting cultural exchange and understanding.

Environmental sustainability: Mining tourism also serves as a viable platform for raising awareness about the environmental impact of mining activities and advocating for responsible mining practices (Maksimović *et al.*, 2016). By integrating environmental education and conservation initiatives into tourism programs, stakeholders encourage and inspire visitors to adopt sustainable behaviours and support efforts to mitigate the environmental impact of mining operations.

Community engagement and empowerment: Sustainable mining tourism initiatives actively involve local communities in the planning, development, and management of tourism activities (Brouder, 2014). This inclusive approach ensures that community interests and needs are addressed while also empowering local residents through participation as guides, artisans, performers, or service providers, thereby strengthening the bond between visitors and the local community.

Heritage safeguarding and interpretation: Prioritising the preservation, interpretation, and presentation of mining heritage sites and landscapes fosters a deeper understanding and appreciation of their historical, cultural, and archaeological significance (Różycki & Dryglas, 2017). Through the development of visitor centres, museums, interpretive trails, and educational programs, stakeholders can further enhance the visitor experience and promote heritage conservation.

Safety and responsible tourism practices: Sustainable mining tourism initiatives promote a high level of consideration toward visitor safety by strictly adhering to safety protocols (Kršák *et al.*, 2015). By providing safety equipment, trained guides, and informative orientation sessions, stakeholders ensure a safe and enjoyable tourism experience while mitigating potential hazards and liabilities.

In summary, while mining tourism offers unique challenges owing to the industrial nature of mining activities and associated environmental and social impacts, it can be assimilated into

a sustainable tourism framework predicated on careful planning, responsible management, and stakeholder engagement. By embracing sustainable tourism practices:

- mining tourism contributes to the sustainable development of mining regions, encourages
- environmental stewardship preserves cultural heritage and offers meaningful experiences
- for visitors, thus aligning with the principles and objectives of sustainable tourism.

2.3 The role of stakeholders in sustainable mining tourism development and management

Tourism, composed of processes, activities, and outcomes resulting from interactions among tourists, tourism suppliers, host governments, communities, and environments, plays a pivotal role in global economies (Amoako & Marfo, 2021). Within this context, stakeholders, defined by Freeman (1984) as groups or individuals capable of affecting or being affected by an organisation's objectives wield significant influence. Within the tourism industry, various stakeholders, including suppliers, government agencies, market intermediaries, non-governmental organisations, the public, and tourists, jointly contribute to the destination's competitiveness (Freeman, 2015).

Furthermore, commercial entrepreneurs view tourism as a profitable opportunity, providing goods and services essential for meeting tourists' needs (Goeldner & Ritchie, 2012). Their involvement in infrastructure and facilities development at mining tourism sites includes establishing visitor centres, museums, gift shops, and amenities that contribute to enhancing the overall visitor experience and destination attractiveness.

Local residents constitute the host community and actively participate in tourism-related activities by serving as guides, artisans, performers, or service providers (Goeldner & Ritchie, 2012). This type of engagement not only supports local economies but also helps preserve cultural traditions that foster a sense of pride and identity within the community.

Overall, policymakers within the local government perceive tourism as a significant contributor to the country's economy (Goeldner & Ritchie, 2012). Accordingly, they formulate and implement policies to ensure the sustainable and economic growth of tourism. While all stakeholders play vital roles in decision-making processes and provisioning within the tourism industry, the government frequently assumes a leadership role due to its extensive regulatory powers and resources (Amoako & Marfo, 2021).

Moreover, collaboration among stakeholders is essential for establishing sustainable tourism development and management (Baggio, 2011). Also, sustainable collaboration fosters vibrant destination brands and facilitates community integration and participation, which are critical aspects of sustainable tourism (Waayers *et al.*, 2011). By engaging in partnerships and networks, stakeholders can leverage shared resources to create value-added experiences and products, thereby enhancing destination appeal and generating increased revenue (New Zealand Tourism Research Institute (NZTRI, 2011).

Additionally, stakeholders play a crucial role in the development and management of sustainable mining tourism. By collaborating effectively and leveraging their respective strengths, stakeholders can significantly contribute to the economic, social, cultural, and environmental sustainability of mining tourism destinations, ensuring their long-term viability and success.

2.4 Challenges faced by fading mining towns

Fading mining towns, characterised by the decline of their primary industry, often experience socio-economic hardships, including unemployment, population decline, and infrastructure decay (Filer & Jenkins, 2017). The transition away from mining-dependent economies poses significant challenges for local communities, thereby requiring innovative strategies for developing economic diversification and community resilience (Crompton, 2010).

One of the primary challenges faced by fading mining towns is economic decline following the closure or downsizing of mining operations (Hilson & Murck, 2000). Case studies, such as the closure of the coal mines in Centralia, Pennsylvania, highlight the devastating economic consequences, such as job losses and loss of tax revenue, leading to widespread poverty and social distress (McGill, 2003). These mining towns often exhibit a high degree of dependency on the mining industry, which leaves them vulnerable to economic shocks (Mudd, 2007). The case study of Broken Hill in Australia exemplifies this challenge, where the decline of the silver, lead, and zinc mining industry led to prolonged economic stagnation and limited opportunities for diversification (Giurco *et al.*, 2010).

Diminishing mining activity can also result in social dislocation as residents are forced to seek employment opportunities elsewhere (Braun & Hammond, 2008). Case studies from mining towns in South Africa, such as Kimberley and Witwatersrand, highlight the social challenges associated with outmigration, including the breakdown of social networks, increased crime rates, and strained public services (Byström, 2022).

Unfortunately, fading mining towns often experience infrastructure decay as a result of reduced investment and maintenance (Githiria & Onifade, 2020). More specifically, case studies from mining towns in the United States, such as Butte, Montana, demonstrate the deterioration of infrastructure, including roads, utilities, and public buildings, as mining activity declines and the population shrinks (Carr, 2007).

Mining operations can also leave behind environmental degradation, posing additional long-term challenges for fading mining towns (Marais & Atkinson, 2006). Case studies from regions like the Appalachian coalfields in the United States further illustrate the environmental impacts of abandoned mines, including water pollution, land subsidence, and habitat destruction, which hinder efforts towards sustainable redevelopment (Weber *et al.*, 2022).

Fading mining towns may also experience the erosion of cultural heritage and identity as traditional practices and community bonds weaken (Byström, 2022). Case studies from mining communities in Wales, such as Blaenavon, highlight the loss of cultural landmarks and intangible heritage, such as language and customs, as the mining industry declines, posing additional challenges relevant to community cohesion and identity (Conlin & Jolliffe, 2011).

Declining mining towns also often lack the resources and capacity needed to adequately address their multifaceted challenges (Stretesky & Lynch, 2011). Case studies from regions like the Appalachians in the United States demonstrate the challenges faced by local governments and community organisations in accessing funding and expertise for implementing sustainable redevelopment efforts, hindering progress towards revitalisation (Prichard, 2019).

In conclusion, fading mining towns confront countless challenges spanning economic, social, environmental, and cultural domains. Case studies provide valuable insight into the specific contexts and dynamics of these challenges, highlighting the need for tailored and holistic approaches to support sustainable development and resilience in these vulnerable communities.

2.5 Sustainable tourism regeneration of fading mining towns

The sustainable tourism regeneration of fading mining towns represents a multidimensional approach aimed at revitalising local economies, preserving cultural heritage, and promoting environmental stewardship. By drawing on case studies and scholarly research, this literature review explores various strategies and initiatives employed in the sustainable tourism regeneration of fading mining towns.

Heritage tourism plays a pivotal role in the regeneration of fading mining towns by leveraging their historical and cultural assets to attract visitors (Richards & Munsters, 2010). Case studies, such as the revitalisation of Jerome, Arizona, highlight how the preservation and promotion of mining heritage sites, including abandoned mines and mining museums, have contributed to economic revitalisation and community pride (Hospers, 2002).

Festivals and cultural events are good examples that demonstrate the unique identity and traditions of waning mining towns, thereby attracting tourists and generating economic activity (Garrod *et al.*, 2012). Case studies from towns like Broken Hill, Australia, also demonstrate how events such as the Broken Hill Heritage Festival celebrate mining heritage through art, music, and cultural performances, fostering community engagement and tourism development (Drennan *et al.*, 2016).

The promotion of ecotourism and nature-based tourism offers opportunities for sustainable regeneration in declining mining towns by capitalising on their natural landscapes and biodiversity (Weaver & Lawton, 2007). Case studies, such as the conversion of Silverton, Colorado, into an ecotourism destination, also emphasise the importance of preserving and conserving natural resources while offering recreational activities such as hiking, birdwatching, and wildlife viewing (Müller, 2015).

Adventure tourism and outdoor recreation initiatives also contribute to the sustainable regeneration of waning mining towns by promoting their rugged terrain and scenic beauty (Horváth & Csüllög, 2012). Case studies from towns such as Queenstown, New Zealand, illustrate how activities such as mountain biking, white-water rafting, and rock climbing attract adventure seekers, which diversify the local tourism product and stimulate economic growth (Rogerson & Rogerson, 2019).

Community-based tourism initiatives empower local residents to participate in tourism development and benefit from resulting economic returns (Scheyvens & Momsen, 2008). Case studies from towns like Røros, Norway, demonstrate how community cooperatives and social enterprises engage residents as tour guides, artisans, and accommodation providers, fostering a sense of ownership and enhancing the authenticity of the visitor experience (Hjalager & Richards, 2002).

Partnerships and collaboration among stakeholders are also critical for the success of sustainable tourism regeneration projects in fading mining towns (Collavitti & Usai, 2015). Case studies from regions such as the Ruhr Valley in Germany highlight how public-private partnerships involving government agencies, businesses, and community organisations have

facilitated the adaptive reuse of industrial heritage sites for tourism purposes, which, in turn, drive economic regeneration and cultural renewal (Roth & Cunningham-Sabot, 2016).

The sustainable tourism regeneration of fading mining towns requires a holistic approach that integrates heritage preservation, cultural promotion, environmental conservation, and community engagement. Case studies provide valuable insight into the diverse strategies and initiatives employed to revitalise these communities, thus emphasising the importance of collaboration and innovation in achieving long-term sustainability and resilience.

3. RESEARCH METHODOLOGY

This study employed a qualitative research design to explore the potential for developing sustainable mining tourism in Arandis, Namibia. A case study approach was utilised to gain in-depth insight into the specific context of Arandis and its dynamics regarding mining heritage and tourism development.

The research methodology focused on a qualitative approach and the methods used included focus group discussions, in-depth interviews, and direct observation where the researchers visited the mining site. During this visit, the researchers collected data by taking notes and photos of what was observed, which were then transcribed. Focus group discussions and semi-structured interviews were conducted with key stakeholders, including local residents, government officials, tourism operators, and community leaders. These interviews provided an opportunity to delve deeply into stakeholders' perspectives on the potential for sustainable mining tourism, as well as the challenges and opportunities faced by the community. Interviews were audio-recorded and transcribed verbatim for detailed thematic analysis. Researchers conducted direct observation by visiting the mining site, tourist attractions, and community spaces in Arandis. Field notes and photographs were taken to document observations and to capture the physical and social environment of the town. This qualitative data complements the focus group responses and interview findings, providing a rich understanding of the context.

Thematic data analysis was used to analyse qualitative data from focus group discussions and in-depth interviews. The data were systematically coded and categorised to identify recurring themes, patterns, and insights related to sustainable mining tourism development in Arandis. This rigorous analysis ensures the validity and reliability of the findings.

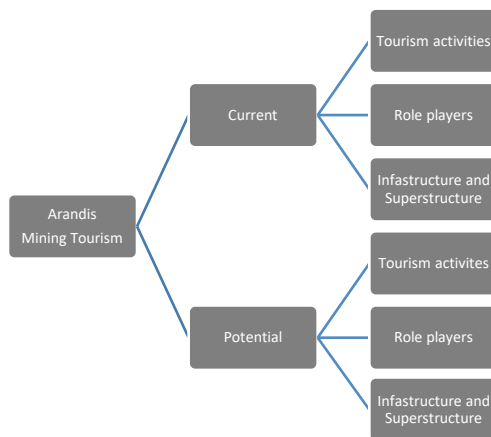
4. FINDINGS AND DISCUSSIONS

The research findings have been analysed based on the objectives outlined in the study, resulting in the identification of three key themes: tourism activities, role players, and tourism

infrastructure and superstructure. These themes were derived from the objectives and supported by the data collected through interviews, focus group discussions, and observations. The analysis of each theme is presented below.

The intention of the researchers was threefold: (1) to explore peoples’ perception and experiences of the glory days of mining in Arandis and the current situation; (2) to observe and visit the mining area with the intention of identifying tangible and intangible heritage; and (3) to seek people’s perception on the development of mining tourism, and their willingness to participate. Interviewees were selected from a pool of key stakeholders with an interest in regional land development and management aspects. The focus of the interviews was on perceptions of mining, tourism, and regional development. The interviews were analysed to extract answers with reference to the research objectives and questions. The interview questions consisted of 24 open-ended questions. The researchers employed codes to represent the participants’ responses. The researchers were able to record, transcribe, and upload all the interviews to the ATLAS.ti software for qualitative data analysis. The research yielded themes which were derived from the research objectives and questions as indicated in Figure 1.

Figure 1: The alignment of themes to the research objectives



Source: Own compilation (2023)

We were able to derive three themes from the objectives: tourism activities, tourism infrastructures and superstructures, and role players, as indicated in Figure 1 above. The findings of the research data were further discussed in the outline above, and 29 codes were derived, which were further linked to the themes.

4.1 Objective 1: To assess current tourism activities in Arandis

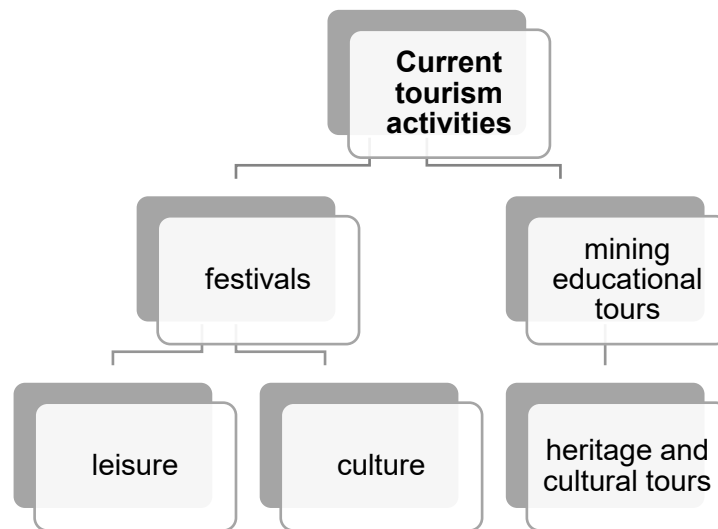
Theme 1: Tourism activities

Arandis, situated approximately 60km from the coastal town of Swakopmund, has a distinct history rooted in uranium mining activities. Established in 1976 by the Rössing Foundation to accommodate employees of Rössing Uranium Limited, the town acquired self-administration and town status in 1995 (Mabayani, 2019; Rössing Uranium Limited, 2022). As defined by Tsyrempilov and Alekseeva (2019), Arandis fits the classification of a monotown, characterised by a significant portion of the working population employed in a single industry, primarily mining, with limited diversification into the secondary sector. In such contexts, the development of tourism emerges as not only economically appealing but also imperative for transitioning to a more sustainable economic activity for the local community.

Typically, mining towns lack tourist infrastructure, such as hotels, tourist information centres, and restaurants catering to tourist needs, with minimal support for leisure activities such as sports and culture (Tsyrempilov & Alekseeva, 2019). However, the concept of sustainable tourism development emphasises meeting the needs of current generations without compromising the ability of future generations to meet their own needs (Patsiuk *et al.*, 2023). Arandis, with its unique desert landscape and proximity to natural wonders, as well as its association with several large mines, holds immense potential to evolve into a competitive and enticing mining tourism destination.

The existing mining heritage and infrastructure provide a foundation for tourism activities centred around heritage tours, cultural festivals, and educational experiences, showcasing the town's history and industry. Additionally, initiatives such as conservation projects funded by mining companies and tourist attractions, like the Hage Geingob viewpoint, contribute to the allure of Arandis as a tourism destination (Rössing Uranium Limited, 2022). As the town seeks to diversify its economy and capitalise on its natural and cultural assets, strategic tourism development efforts can position Arandis as a compelling destination for sustainable mining tourism. Below is an indication of the current tourist activities in Arandis.

Figure 2: Current tourism activities in Arandis



Source: Own compilation (2023)

The information in Figure 2 enabled the researcher to develop an interview question linked to the research theme as indicated.

Question 1: What are the current tourism activities that exist in Arandis?

In 1984, Rössing Uranium Limited was involved in sponsoring a conservation trial consisting of two boys and a field officer. This hiking trail lasted a week, consisting of tourism activities, such as hiking and camping in Northern Damaraland. The company was and is still involved in funding several conservation/heritage projects across the country, such as the Hoba Meteorite in Grootfontein, Okashana Centre in the northern region, and the Okanjande project in Otjiwarong (Rössing Uranium Limited, 2022). To date, Rössing Uranium Limited is the longest-operated uranium mine in Arandis.

The town council management has indicated that Arandis has been a popular destination for visitors from national and international boundaries with a special interest in uranium mining. Arandis's mayor also pointed out that Rössing Uranium Limited offers tours not only to business investors but also to scholars. The tour starts with a general overview of the operation and a visit to the Hage Geingob viewpoint, where the largest open pit mining operation lies. These tours are usually booked at the Swakopmund Museum, 60 km from Arandis, while the proceeds of the tours are donated to the Swakopmund Museum.

The marketing manager of the Arandis Town Council indicated that the town had hosted a few festivals focusing on business investment and cultural heritage. In 2015, Rössing Uranium Limited, in collaboration with the Arandis Town Council, hosted the first-ever investment conference and Arandis Uranium Festival, and in 2021, Arandis hosted their first-ever virtual

Rössing Marathon championship and virtual birdwatching day for Namibian School learners, with more than 600 students across the country visiting the town (Rössing Uranium Limited, 2022). All these events were geared towards promoting Arandis as a business harbour for entrepreneurs in various industries. Overall, Rössing Uranium Limited is a major player in the development of heritage tours and conservation activities within and outside the town.

4.2 Objective 2: To identify possible role players who could be involved in the planning, development, and implementation of sustainable tourism in Arandis

Theme 2: Current role players in the development of mining tourism in Arandis

The involvement of stakeholders is crucial for the expansion and sustainable development of the economy (Amoako *et al.*, 2021). Each stakeholder has a significant role to play in effectively and efficiently participating in the development process. Collaboration among stakeholders is, therefore, essential to mitigate potential long-term costs arising from conflicts and differences between various groups (Fathimath, 2015). When stakeholders recognise the potential benefits of collaboration, it can effectively resolve conflicts and advance shared visions.

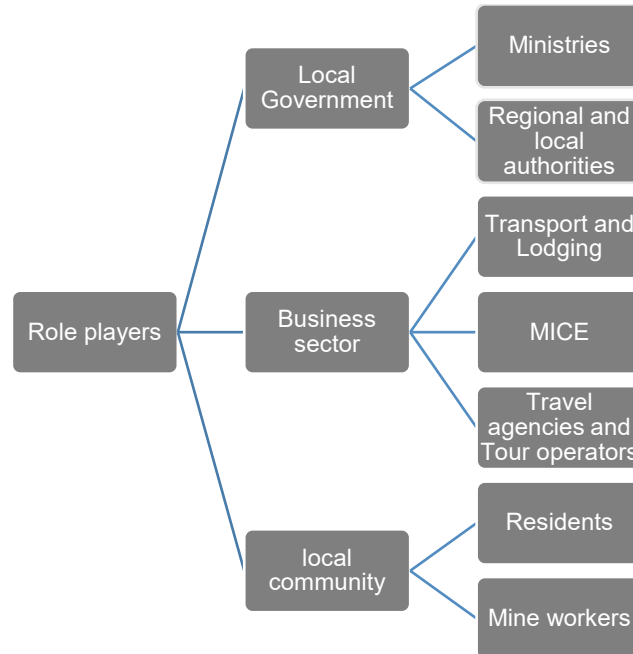
Mining towns, often emerging from periods of economic recession, necessitate the exploration of new economic prospects. Institutional strength and responsibility are crucial, with each stakeholder taking ownership of roles or activities to create and expand projects in mining towns (Conlin & Jolliffe, 2011). Typically, projects in mining towns are developed and guided by associations or foundations with support from the public sector.

In the case of Arandis, local and regional authorities, along with Rössing Uranium Limited, have initiated small-scale projects to preserve their mining heritage. Projects such as the establishment of a crafts centre and a mining museum have garnered interest from both administrations in recent years. However, these projects remain incomplete due to the substantial investments required. Despite this, local organisations, in collaboration with the local council and individuals, have undertaken small-scale projects to preserve the cultural and heritage aspects of traditional mining and local cultural life.

It is evident that collaboration among stakeholders, including mining companies, local authorities, community organisations, and residents, is essential for the sustainable development of mining tourism in Arandis. Despite challenges such as incomplete projects and limited funding, stakeholder engagement and collaboration are vital for realising the full

potential of mining tourism in the region. Below is an illustration of the collaborations identified in Arandis.

Figure 3: The role players and participation in Arandis’s tourism industry



Source: Own compilation (2023)

The information in Figure 3 allowed the researcher to develop an interview question linked to the research theme as indicated below:

Question 2: Who are the role players involved in sustainable tourism planning, development, and implementation in Arandis?

The local authority of the Arandis Town Council consists of a management team which is responsible for the development and management of the town’s infrastructure and superstructure. The mayor of the town has indicated that Rössing Uranium Limited has played a significant role in the development of infrastructure and superstructure, such as a school, sports field, hospital, science lab, and library, in Arandis town. The management committee indicated that tourism was not part of the main objectives of the council’s strategic plan for 2022 towards the development of the town. However, Rössing Uranium Limited has made provisions to preserve the mining equipment by creating a museum onsite and off-site the mine. The research team was able to observe mining equipment at the main entrance of the town, in the city centre, and the mine vicinity.

4.3 Objective 3: To evaluate the current infrastructure and services that can support the envisioned sustainable tourism development

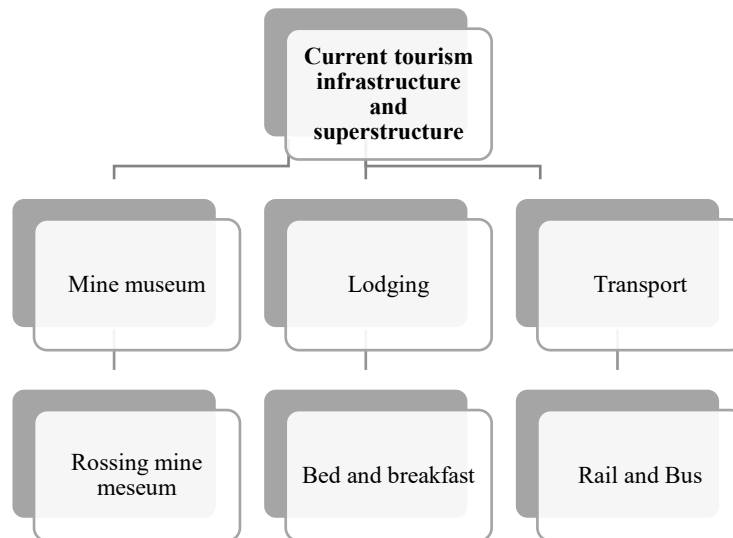
Theme 3: The current tourism infrastructure and superstructure in Arandis.

Historically, the closure of mines has often left behind abandoned infrastructure, including gaping holes in the ground, dilapidated buildings, and corroded machinery. Despite their disrepair, these remnants contribute to the heritage of mining areas and shape the identities of modern communities (Conesa, 2010). However, when mines cease operations, their infrastructure can transition from assets to liabilities, resulting in lost revenue and the abandonment of infrastructure as populations decline. As businesses and institutions close due to declining populations, infrastructure is left unused (Conesa, 2010).

In Arandis, the legacy of uranium mining has left behind both tangible and intangible infrastructures. The town's landscape bears witness to the industrial heritage of mining operations, with remnants such as abandoned mine sites and decaying buildings serving as reminders of the town's past. While these remnants contribute to the cultural heritage of Arandis, their potential for tourism development hinges on their preservation and repurposing. Efforts to utilise and showcase these remnants as part of the tourism experience could transform liabilities into assets, thereby supporting sustainable tourism development.

The evaluation of the current tourism infrastructure in Arandis must consider not only physical structures but also intangible assets, such as cultural heritage and community identity. Strategies for repurposing and preserving mining infrastructure should be explored to capitalise on the potential of Arandis as a tourism destination. Moreover, collaboration among stakeholders, including local authorities, mining companies, and community organisations, is essential to unlock the tourism potential of Arandis's mining heritage while ensuring sustainable development for the future.

Figure 4: The current tourism infrastructure and superstructure



Source: Own compilation (2023)

The information in Figure 4 enabled the researcher to create an interview question linked to the theme as indicated below:

Question 3: What are the current tourism infrastructures and superstructures that exist in Arandis?

The Arandis Town Council members, management and Rössing Uranium Limited management relayed that Rössing Uranium Limited provided the current infrastructure and constructed modern, well-equipped houses, a school, and a hospital in Arandis for their employees. Municipal services, such as electricity and water, were heavily subsidised by the mine. The mine also built sports and recreational facilities and provided 78 sponsorships that ensured an active sports system in the town.

Man-made landscapes are also seen as part of the cultural heritage of an area. Humans are a major factor in transforming landscapes through the shifting of rock and soil to accommodate buildings, roads, railway lines, etc. According to Scovazzi (2019), cultural landscapes are representatives of the evolution of human society related to their natural environment and of consecutive social, economic, and cultural factors. In Namibia, industrial monuments are recognised primarily for their museum or monumental use. Vogt’s inventory of National Monuments in Namibia lists five proclaimed industrial heritage sites, two of which are related to the development of the railway, while the other three are associated with the supply of water in the desert environment (Alexander, 2010). Although various old mining-magnate houses in Lüderitz have been declared national monuments, the decision was attributed primarily to

aesthetic and architectural concerns. However, mining and related industrial sites, such as the Lüderitz power station, have not yet been added to the National Heritage Register. Considering the importance of the industrial revolution that took place at Kolmanskop (and in the surrounding Sperrgebiet) at the turn of the century, along with the significant role that mining still plays in the Namibian economy, this appears to be a glaring omission and one which should be remedied as a matter of priority (Alexander, 2010). Rössing Uranium Limited has not yet declared and registered the mining site or the old equipment and machinery as national monuments in Arandis. Although linked to vast literature and evidence of history from decades of the mines' operation, the management indicated that the museum is yet to be officially registered as part of the national or international heritage platforms.

4.4 Objective 4: To recommend mining heritage tourism as a sustainable tourism activity in Arandis

Theme 4: Potential tourism activities

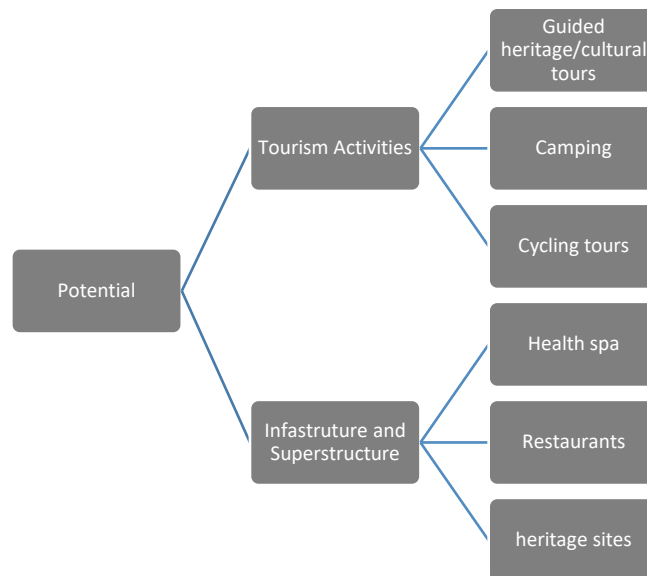
The mining industry has historically played a pivotal role in the economic development of towns, bringing with it specialised knowledge, skills, and cultural influences (Conlin & Jolliffe, 2011). However, mine closures often lead to economic stagnation and necessitate the exploration of new business activities to compensate for lost income (Conlin & Jolliffe, 2011). In Arandis, residents acknowledge the positive impact of Rössing Uranium Limited on their living standards, with many residents establishing businesses, such as curio shops, takeaway facilities, and bed and breakfast venues to cater to mine employees. However, there is a recognition of the need to generate strategies for restructuring the town's economy in the event of mine closure.

Upon the cessation of mining activities, large contaminated areas require specific treatment to revitalise them for sustainable use. This involves rejuvenating contaminated surfaces and integrating them into the landscape to restore environmental, aesthetic, and economic functions (Schejbal, 2016). Successful examples of mining heritage development, such as the mining museum of La Unión in Spain, demonstrate the potential for tourism to revitalise former mining areas. The museum attracts a diverse range of visitors, including school groups, tourists from nearby areas, and local and regional communities, highlighting the broad appeal of mining heritage tourism (Conesa, 2010).

In Arandis, mining heritage tourism holds promise as a sustainable economic activity that can leverage the town's unique history and cultural identity. By repurposing and showcasing mining infrastructure, developing interpretive centres and heritage trails, and offering guided tours, Arandis can attract visitors interested in learning about its mining heritage. Collaborative

efforts among stakeholders, including mining companies, local authorities, and community organisations, are essential to realising the potential of mining heritage tourism and ensuring its long-term sustainability in Arandis.

Figure 5: Potential tourism activities, infrastructure, and superstructure



Source: Own compilation (2023)

Mining sites located near highly visited places may solve the lack of lodgings or other leisure services and may offer an additional attraction to conservative tourists. On the other hand, in these cases, the mining sites are reduced to a simple “one journey” attraction with limited capacities to generate important cash flows (Conesa, 2010), as indicated in Figure 5.

Mining museums, as tourist attractions, are a well-documented occurrence in various parts of the world (Kruczek & Kruczek, 2016; Rybár & Štrba, 2016; Xie, 2015), and mining tourism is a form of tourism that is argued to attract visitors due to the mystique of the wealth and treasure produced (Conlin & Jolliffe, 2011; Pretes, 2002) (Byström, 2022). Thus, if managed sustainably, mining tourism can revamp and develop new infrastructure and the superstructure of a fading mining town while reconstructing the business strategy from an industrial structure to a heritage tourism superstructure.

The information in Figure 5 above enabled the researcher to develop the following interview question linked to the theme:

Question 4: What are the solutions to promote and develop potential mining heritage tourism as part of sustainable tourism in Arandis?

Tourism has emerged as a potential avenue to revitalise declining mining towns, offering opportunities to leverage their cultural heritage and historical legacies for economic development (Conlin & Jolliffe, 2011). However, the success of a mining tourism industry depends on the community's recognition of opportunities to reshape the town's infrastructure to cater to a niche tourism market (Conlin & Jolliffe, 2011). Central to this concept is the extent to which the community has integrated the cultural legacy and historical remnants of local mining activities into its heritage (Schejbal, 2016).

In Arandis, there is potential to develop mining tourism by showcasing mining tools, technologies, minerals, and historical personalities associated with the mining industry (Schejbal, 2016). This could involve the creation of interpretive centres, heritage trails, and guided tours to educate visitors about the town's mining heritage. However, the value placed on this heritage by the community will determine the success of such endeavours (Conesa, 2010).

5. CONCLUSION

In conclusion, the mining industry leaves behind a significant number of tangible and intangible remnants, which can be repurposed for various purposes, including mining heritage. These remnants encapsulate cultural and social values inherent to past and present mining activities, underscoring the importance of preserving mining heritage for future generations (Schejbal, 2016). It should be noted that mining heritage can play a pivotal role in sustainable tourism development, particularly in fading mining towns. These heritage features contribute to the town's tourist appeal and can be preserved as historic sites in local museums (Schejbal, 2016). However, it is essential to ensure that mining heritage tourism is not pursued at the expense of environmental conservation and that it serves educational functions beyond the generation of income (Schejbal, 2016). As with all forms of cultural tourism, the interpretation and management of mining heritage must be undertaken in a sustainable manner so as to ensure its preservation for future generations (Schejbal, 2016). Thus, mining heritage emerges as a valuable asset in the revitalisation of fading mining towns, contributing to their economic, cultural, and environmental sustainability.

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