

Preservation Challenges to the Tangible and Intangible Heritage of the Ombilin Coal Mining Heritage of Sawahlunto: A Literature Review

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ABSTRACT

This article examines the tangible and intangible heritage of the Ombilin Coal Mining Heritage of Sawahlunto and addresses the preservation challenges affecting its sustainability. The study specifically investigates the forms of heritage associated with the mining landscape and the principal threats that may compromise their continued preservation. Using a qualitative approach based on a literature review, the study draws on books, official UNESCO documents, journal articles, theses, reports, and online databases. The findings show that the Ombilin Coal Mining Heritage encompasses tangible heritage, including former mining sites and supporting facilities, as well as diverse forms of intangible cultural heritage associated with the historical mining landscape. The literature further identifies development pressure, environmental deterioration, natural hazards, and human-induced disasters as major threats to the integrity and continuity of these heritage components. These findings demonstrate that the significance of Ombilin derives from the interrelationship between its tangible and intangible heritage, requiring preservation approaches that address both dimensions and their respective vulnerabilities. The study contributes to a more integrated understanding of the heritage values and preservation challenges affecting the sustainability of the Ombilin Coal Mining Heritage of Sawahlunto.

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INTRODUCTION

In 1858, the Dutch colonial administration suspected the presence of substantial coal reserves in the Ombilin region and subsequently initiated geological investigations. Mining expert Ir. C. De Groot first surveyed areas considered likely to contain coal, followed by Ir. W. H. de Greve, who received an official assignment under the Decree of the Governor-General of the Dutch East Indies dated 26 May 1867. Further investigation led to the discovery of a coal seam in 1868 at Ulu Air on the banks of the Ombilin River in Sawahlunto (Pujianti, [2010](#)). R.D.M. Verbeek, a Dutch geologist involved in investigating Ombilin coal, later estimated that the area contained approximately 197 metric tons of coal reserves. These discoveries established the foundation for the subsequent development of Sawahlunto as an important coal-mining landscape.

Sawahlunto remained heavily dependent on coal mining, which had shaped the city for more than a century. The depletion of coal reserves gradually weakened this economic foundation and created the risk that Sawahlunto could become a "ghost town" characterized by declining economic activity and the loss of its principal source of livelihood. In response, the municipal government and various stakeholders sought to transform the former mining city into a tourism destination by utilizing its mining sites and cultural heritage. This transition repositioned former industrial spaces as cultural and tourism assets and created a distinctive visitor experience rooted in Sawahlunto's mining history (Asoka et al., [2017](#); Hendrawan, [2026](#)). The transformation also increased the importance of preserving the historical and cultural values embedded in the former mining landscape.

Government initiatives to preserve Sawahlunto's mining heritage developed alongside this economic and cultural transformation. The government began cataloging historic buildings in 2002, designated the Ombilin Coal Mine as a national cultural heritage site in 2014, and achieved its inscription as a UNESCO World Heritage Site in 2019 (Operational Guidelines for the Implementation of the World Heritage Convention, [2012](#)). UNESCO recognition reflects the *Outstanding Universal Value* of the Ombilin Coal Mining Heritage of Sawahlunto and its significance within the history of industrial development. The site satisfies Criteria ii and iv through its evidence of technological exchange between Europe and its colonies and its representation of an integrated technological system for coal extraction, processing,

transportation, and shipment (Fitriawan et al., [2020](#)). These values establish Ombilin not merely as a collection of former mining structures but as an interconnected industrial and cultural landscape.

Under Criteria ii and iv, the Ombilin complex demonstrates the transfer and adaptation of mining knowledge, engineering technologies, and production systems during the second half of the nineteenth century and the early twentieth century. Its technological infrastructure included deep vertical mining shafts, mechanical washing and sorting systems, steam-powered machinery and railways, railway bridges, tunnels, dredged ports, and coal-storage facilities. The industrial system also incorporated a purpose-built mining town that accommodated more than 7,000 inhabitants and provided housing, food services, healthcare, education, spiritual services, and recreation to sustain the industrial organization and hierarchical division of labor (Managing Cultural World Heritage, [2013](#)). These tangible components developed alongside social practices, knowledge, memories, and other intangible dimensions associated with the mining community. The interrelationship between these dimensions makes the preservation of Ombilin more complex than the physical conservation of industrial structures alone.

UNESCO inscription does not represent the final stage of heritage preservation, as recognition also entails an obligation to maintain the property's values, integrity, and sustainability. Every World Heritage Site requires an effective protection and management system to ensure that its heritage values remain accessible to present and future generations (Managing Cultural World Heritage, [2013](#)). The transformation of Sawahlunto from a mining-based economy to one centered on heritage and tourism situates its tangible and intangible heritage within changing environmental, developmental, and social conditions. These circumstances make preservation challenges particularly important, as pressures on physical sites may also affect the cultural practices, historical memories, and social meanings associated with the mining landscape. Examining threats to Ombilin, therefore, requires an integrated perspective that considers the vulnerability of both material and non-material heritage.

Existing discussions have established the historical development of Ombilin, its industrial significance, its *Outstanding Universal Value*, and the technological characteristics underlying its World Heritage recognition (Asoka et al., [2017](#); Fitriawan et al., [2020](#); Managing Cultural World Heritage, [2013](#)). Within the literature reviewed in this study, these dimensions receive greater attention than an integrated examination of how current preservation challenges affect both tangible and intangible components of the Ombilin heritage landscape. This imbalance creates a research problem because understanding the significance of heritage alone does not sufficiently explain the vulnerabilities that may affect its long-term sustainability. A literature-based synthesis is therefore necessary to identify the forms of tangible and intangible heritage associated with Ombilin and to examine the development and the environmental, natural, and human-induced pressures discussed in existing sources. Such an approach shifts the analytical focus from establishing why Ombilin is significant to examining what may threaten the continuity of that significance.

This study addresses that gap by reviewing the tangible and intangible heritage of the Ombilin Coal Mining Heritage of Sawahlunto together with the preservation challenges and threats identified in the existing literature. Its novelty lies in integrating these heritage dimensions and their vulnerabilities within a single analytical framework rather than treating the site's physical remains, cultural values, and preservation problems as separate subjects. The study specifically asks how the literature characterizes Ombilin's tangible and intangible heritage and what principal threats may affect their preservation and sustainability. By synthesizing these issues, the study seeks to clarify how development pressure, environmental deterioration, and natural or human-induced hazards intersect with the preservation of the mining heritage landscape. This synthesis provides a more integrated basis for understanding the current preservation challenges facing the Ombilin Coal Mining Heritage of Sawahlunto.

METHOD

This study employed a qualitative approach through a *literature review*. Qualitative research aims to describe and analyze phenomena, events, social activities, attitudes, beliefs, perceptions, and the thoughts of individuals and groups (Rachman et al., [2024](#)). The study applied this approach to examine the Ombilin Coal Mining Heritage of Sawahlunto as a UNESCO World Heritage Site and to identify the preservation issues and threats discussed in the available literature. The review focused on literature relevant to the historical and cultural significance of Ombilin, its tangible and intangible heritage, and the challenges affecting its preservation. This approach enabled the study to synthesize information dispersed across various documentary sources.

The study collected secondary data from books, official documents available through the UNESCO *website*, journal articles, theses, reports, and relevant online sources. The literature selection process prioritized sources that directly addressed the Ombilin Coal Mining Heritage of Sawahlunto, its UNESCO World Heritage status, historical development, tangible and intangible heritage, and preservation issues and threats. The author identified relevant literature by examining titles, abstracts, keywords, and, where necessary, full texts to determine their relationship to the research objectives. Sources that did not provide information relevant to Ombilin's heritage characteristics or preservation challenges were excluded from the analysis. The available research documentation does not specify a fixed publication-period restriction; consequently, the review included relevant sources based on their substantive relevance rather than imposing an unsupported chronological limit.

The author classified the selected literature according to the principal themes that emerged from the research objectives. The first category addressed tangible heritage, including mining sites, industrial structures, buildings, infrastructure, and other physical remains associated with the Ombilin mining landscape. The second category covered intangible heritage, including cultural practices, knowledge, collective memory, and other non-material values associated with the mining community. The remaining literature was grouped according to preservation challenges, particularly development pressures, environmental deterioration, and natural or human-induced disaster threats. This thematic classification enabled the analysis to compare how different sources describe heritage values and the vulnerabilities that affect their sustainability.

The study analyzed the classified literature qualitatively by identifying recurring information, similarities, differences, and relationships among the themes reported across the selected sources. Source triangulation strengthened the analysis by comparing information from books, scholarly publications, theses, reports, online sources, and official UNESCO documents rather than relying on a single type of evidence. The author treated information as more strongly supported when different source categories provided consistent descriptions of the same heritage characteristic or preservation issue. In contrast, differences among sources were considered during interpretation rather than automatically reconciled. This process allowed the study to distinguish documented heritage characteristics from interpretations concerning their preservation challenges. The results are presented narratively and supplemented with tables and figures to organize and clarify the findings.

RESULT AND DISCUSSION

Tangible Heritage of the Ombilin Coal Mining Heritage of Sawahlunto

The Ombilin Coal Mining Heritage of Sawahlunto comprises twelve components containing a total of twenty-four attributes. Collectively, these twelve components cover 268.14 hectares within a single buffer zone extending over 7,356.96 hectares. The components extend across four cities and three regencies: Sawahlunto City, Tanah Datar Regency, Padang Panjang City, Padang Pariaman Regency, Padang City, Solok City, and Solok Regency. This extensive geographical distribution demonstrates the spatial scale of the mining heritage landscape and the physical infrastructure associated with its historical operation (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

The twelve components are organized into three principal areas: Area A, Area B, and Area C. Although geographically separated, these areas remain functionally interconnected as parts of an integrated technological system developed for coal extraction, processing, transportation, storage, and shipment. The system enabled coal from the Ombilin mine to be transported across the mountainous, forested landscape of West Sumatra before reaching port facilities on the Indian Ocean. This functional relationship between mining, railway transportation, and port infrastructure constitutes an essential characteristic of the tangible heritage of Ombilin (Armis & Kanegae, [2020](#); Management Plan for Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Area A encompasses the mining site and the Sawahlunto Company Town. It contains six of the twelve components and eighteen of the twenty-four identified attributes of potential *Outstanding Universal Value*. The area includes an extensive underground mining system comprising approximately 10 km of mining tunnels, together with surface structures that supported coal extraction and processing. Historical mining activities first extracted and processed coal within this area, making it the principal production zone of the Ombilin industrial complex. Area A also includes Sawahlunto Company Town, which the Ombilin Mining Company constructed adjacent to the mine to accommodate

mining engineers, miners, their families, and supporting personnel. The concentration of mining, processing, residential, administrative, and supporting infrastructure demonstrates the integrated physical organization of the historical mining settlement (Management Plan for Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Area B represents the transportation system connecting the Ombilin mining complex to its broader distribution infrastructure. It contains five of the twelve components and five of the twenty-four identified attributes of potential *Outstanding Universal Value*. Its principal feature is a 155-km railway line that crosses mountainous terrain and incorporates innovative rack-railway technology to connect the Ombilin mine to the Port of Emmahaven. The transportation infrastructure also includes railway bridges, tunnels, and three stations positioned along the route to support railway operations. These physical elements demonstrate how railway engineering served as an essential link between coal production in Sawahlunto and its subsequent transportation to the coast (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

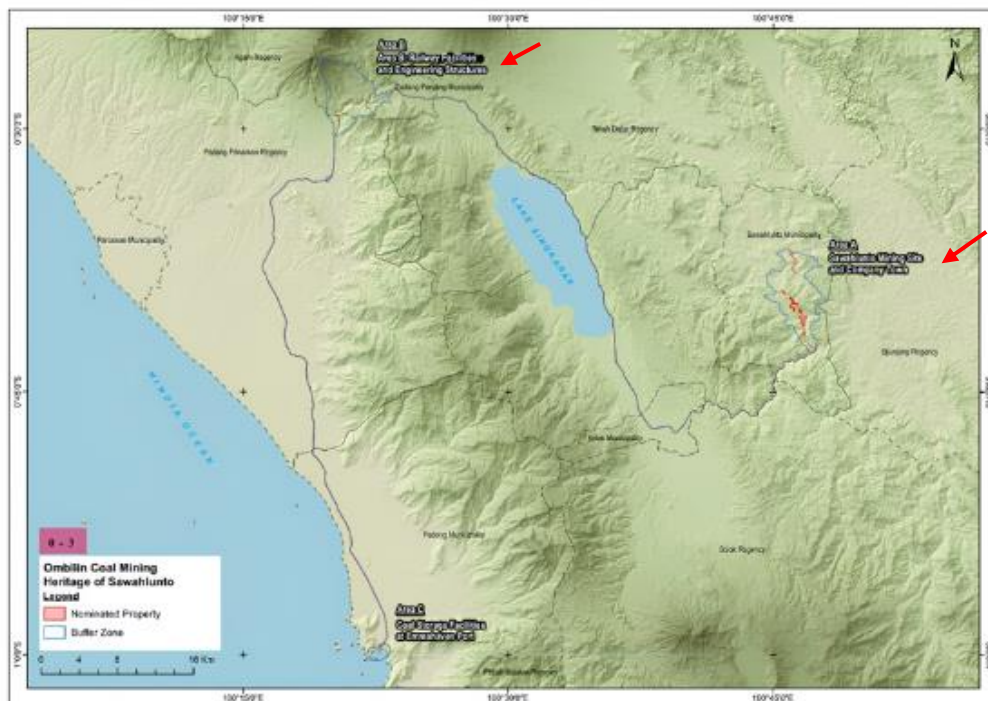


Figure 1: Map Showing the Locations of the Three Areas of the Ombilin Coal Mining Heritage of Sawahlunto (Source: Ministry of Education and Culture of the Republic of Indonesia, Government of West Sumatra, 2017)

Area C comprises the coal storage and transshipment facilities at Emmahaven Port on the western coast of Sumatra facing the Indian Ocean. The port received coal transported from the Ombilin mine and provided facilities for its storage and subsequent shipment. Within the serial property, Area C represents one of the twelve components and contains one of the twenty-four identified attributes of potential *Outstanding Universal Value*. Its location and function completed the integrated technological chain connecting extraction and processing in Area A with railway transportation in Area B and maritime shipment from the coast. Area C, therefore, represents the final physical component of the interconnected coal-production and distribution system documented within the Ombilin heritage landscape (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Table 1 . Components and Attributes of the Ombilin Coal Mining Heritage of Sawahlunto

Area	Component Name	Location	Component Area (ha)	Buffer Zone Area (ha)
A. Mining Site and Sawahlunto Company Town	A1. Soengai Doerian Mining Site	Sawahlunto City	7.91	3,451.38
	A1.1 Doerian Mine Complex			

Area	Component Name	Location	Component Area (ha)	Buffer Zone Area (ha)
	A1.2 Pandjang Mine Complex			
	A1.3 Soengai Doerian Mine Complex			
	A1.4 Loento Mine Shaft Complex			
	A1.5 Mining Tunnel			
	A2. Mining School	Sawahlunto City	0.34	
	A3. Coal Processing Plant Complex	Sawahlunto City	12.60	
	A4. Ombilin Railroad Transportation	Sawahlunto City	10.89	
	A4.1 Sawahlunto Train Station			
	A4.2 Kubang Sirakuak Power Plant			
	A4.3 Kalam Railroad Tunnel			
	A4.4 Muara Kalaban Railroad Station			
	A5. Company Town	Sawahlunto City	32.94	
	A5.1 Mining Administration Complex			
	A5.2 Workplace Complex			
	A5.3 Healthcare Facilities			
	A5.4 Market			
	A5.5 Supporting Facilities			
	A6. Salak Power Plant and Rantih Water Pumping Station	Sawahlunto City	18.14	
	A6.1 Salak Power Plant Complex			
	A6.2 Rantih Water Pumping Station Complex			
	B. Ombilin Railroad	Sawahlunto City, Solok City, Padang Panjang City, Padang City, Solok Regency, Tanah Datar Regency, and Padang Pariaman Regency	173.27	3,591.27
	B2. Batu Tabal Train Station	Tanah Datar Regency	0.79	
	B3. Padang Pandjang Train Station	Padang Panjang City	3.69	
	B4. Tinggi Bridge	Padang Pariaman Regency	0.15	
	B5. Kayu Tanam Train Station	Padang Pariaman Regency	1.29	
C. Coal Storage Facility at Emmahaven Port	C1. Coal Storage	Padang City	6.13	314.31
TOTAL			268.14	7,356.96

(Source: Ministry of Education and Culture of the Republic of Indonesia, Government of West Sumatra, 2017)

Intangible Cultural Heritage and the Formation of Mining Community Identity in Sawahlunto

The name Sawahlunto derives from two words, *sawah* and *lunto*, reflecting the geographical and agricultural character of the area before the development of coal mining. Rice fields occupied the valley through which a tributary of the Batang Lunto River flows. At the same time, local communities also referred to the area as *Sawah Aru* because *aru* trees surrounded the fields. Sawahlunto originally functioned as an agricultural area cultivated by communities from Nagari Lunto, Nagari Lumindai, and Nagari Kubang. This agricultural landscape formed the social and environmental setting that preceded the emergence of the mining town. The historical meaning of the place name therefore preserves an important connection between Sawahlunto's cultural memory and its pre-mining landscape (Asoka et al., 2017; Wimra et al., 2026).

The Dutch referred to Sawahlunto as *Lunto Kloof*, with *kloof* meaning "valley," in reference to its location within a valley surrounded by hills. Ir. Th. F. F. Delprat documented the physical condition of Sawahlunto before its

transformation into a mining area through a historical photograph. The photograph depicts an agricultural landscape consisting of rice fields, a flowing river, and surrounding hills, without visible permanent residential settlements. This visual record illustrates the marked contrast between Sawahlunto's earlier agricultural landscape and the mining settlement that subsequently developed there. The historical photograph consequently provides important evidence of the physical and social transformation associated with the emergence of the mining industry (Perdiana & Mubarak, [2022](#)).

Sawahlunto may not have supported a substantial permanent settlement before the development of mining activities. People already used the area, but they primarily occupied *dangau*, or small huts built in rice fields and other agricultural areas, temporarily while tending crops, particularly before harvest. De Greve and Kalshoven recorded similar conditions during their investigations of coal deposits, noting the absence of established permanent habitation in the area. Verbeek's investigation of the coal deposits in 1875 likewise reported comparable conditions (Sudarmoko & Putra, [2026](#)). These accounts indicate that the expansion of coal mining fundamentally altered both settlement patterns and the demographic composition of Sawahlunto.

Preparations for coal mining stimulated substantial population movement into Sawahlunto as mining companies recruited workers from different regions and ethnic backgrounds. Workers included Chinese, Javanese, Nias, Batak, and other communities because mining companies considered the available local workforce insufficient for the physical demands of mining labor. Local inhabitants initially showed limited interest in employment in the mine and generally regarded wage labor as supplementary to agricultural activities. At the same time, many Minangkabau preferred occupations that offered greater independence and flexibility, particularly trade and farming. This pattern gradually changed during the early twentieth century, as Minangkabau workers increasingly entered the coal mining industry, although many came from areas outside the immediate mining zone. Those who worked in the mines generally held the status of independent laborers (Zubir, [2018](#)).

The convergence of workers from diverse ethnic and linguistic backgrounds transformed Sawahlunto into a multicultural mining community and gave rise to distinctive forms of cultural interaction. Continuous interethnic contact encouraged cultural adaptation and acculturation that extended beyond the mining industry's physical infrastructure. One of the most prominent outcomes was the development of the Tansi language through interaction among miners who spoke different languages (Syafri, 2019). Traditional arts associated with various ethnic communities, as well as Sawahlunto's songket craftsmanship, also form part of the region's intangible cultural heritage. These cultural expressions demonstrate that the significance of the Ombilin mining landscape extends beyond its mines, railways, buildings, and industrial infrastructure to encompass the social and cultural practices of the communities associated with mining.

The Tansi Language

The Tansi language is a creole language that has developed in Sawahlunto for more than a century. It originated as a *pidgin*, a temporary contact language without native speakers, before developing into a creole acquired as a first language by subsequent generations of the Tansi community and used in everyday social activities. Its development occurred through four principal phases: the emergence of a *pidgin* through limited communication among mine workers from different linguistic backgrounds; the emergence of native Tansi speakers through interethnic marriages; increasing influence from Indonesian and Minangkabau; and the contemporary process of decreolization toward these more standardized languages. This linguistic development directly reflects the multicultural social environment created by the mining workforce. The Tansi language, therefore, represents an intangible cultural expression closely connected to the historical formation of Sawahlunto as a mining community (Syafri, [2019](#)).

Several interconnected social factors currently contribute to the decolonization of the Tansi language. Among adolescents, perceptions of modernity and intensive social-media use encourage the adoption of *slang*, while occupational environments influence adult language choices. Government employees tend to use Indonesian because they associate it with education and social prestige, whereas miners and merchants use Tansi and Minangkabau more frequently. Educational institutions reinforce Indonesian by using it as the principal language of instruction, while social interaction with newcomers increases exposure to Indonesian and Minangkabau. Social mobility also influences language preferences, as adolescents who pursue higher education in places such as Padang and Java frequently adopt Indonesian and *slang*, continuing to use them after returning to Sawahlunto (Syafri, [2011](#)).

The social environment further shapes the intergenerational transmission of Tansi. Adolescents increasingly use *slang* and Indonesian in peer interactions, while many workers rely on Indonesian when communicating across occupational and social groups. Newcomers commonly use Minangkabau and Indonesian because they perceive Sawahlunto as part of the wider Minangkabau-speaking environment of West Sumatra and regard Indonesian as a language understood across communities. These linguistic choices gradually reduce the social domains in which Tansi functions as the principal medium of communication. The continuing process of decreolization, therefore, represents a preservation challenge because the sustainability of Tansi depends not only on formal recognition but also on its continued everyday use across generations (Syafri, [2011](#)).



Figure 2. Map of Tansi Language Usage
(Source: Syafril, 2011)

Despite these pressures, several factors continue to support the survival of the Tansi language. Members of the Tansi community still use the language in interpersonal communication, while some people of Minangkabau background have also acquired the ability to speak Tansi (Aditiawarman & Novita, [2024](#)). The Indonesian Ministry of Education and Culture designated the Tansi language as an Intangible Cultural Heritage of Indonesia in 2018, formally recognizing its cultural significance and strengthening efforts to maintain its continuity. Syafril ([2019](#)) proposes several preservation measures, including developing a local-content curriculum for teaching Tansi in schools and establishing policies that encourage its use in formal settings on designated days. These measures demonstrate that safeguarding Tansi requires both institutional support and continued transmission within the community.

Songket or Silungkang Weaving

Songket, also known as Silungkang weaving, represents one of Sawahlunto's distinctive cultural attractions and has become an important marker of the city's cultural identity, particularly among the people of Silungkang. The weaving tradition also provides a livelihood for many residents, especially those in Silungkang Subdistrict. Women traditionally undertake most songket weaving, reflecting the close relationship among weaving skills, gender roles, and cultural identity in the local community. A local saying expresses the cultural importance of this skill: "A young girl should not claim to be a woman of Silungkang if she is not skilled in weaving songket" (Asoka et al., [2017](#); Melinda et al., [2021](#)). This expression demonstrates that Silungkang weaving serves not only as an economic activity but also as a cultural practice passed down through generations.

The distinctive character of Silungkang songket lies primarily in its weaving technique, particularly in the arrangement of the weft threads used for decoration. These continuous weft threads extend across the reverse side of

the fabric, causing them to appear more prominent on the front surface than the warp threads that form the basic structure of the textile. Silungkang weaving also possesses distinctive decorative motifs that reinforce its local cultural character. These motifs include *bungo malur*, *pucuk ranggo patani*, *kudo-kudo*, *batanduak*, *pucuk jawa*, *pucuk kelapa*, *tigobaleh*, and *kain balapak gadang* (Namira, [2024](#)). The combination of weaving techniques and locally recognized motifs distinguishes Silungkang songket as a specific form of textile craftsmanship associated with Sawahlunto.

The government has undertaken several initiatives to preserve Silungkang weaving by strengthening the skills and productive capacity of local weavers. The Sawahlunto Cooperative, Industry, and Trade Office has supported community empowerment through weaving training programs designed to improve weaving skills and increase production. These initiatives primarily seek to strengthen the economic well-being of local communities and expand the volume of woven-fabric production. At the same time, the transfer of weaving knowledge and practical skills through these programs indirectly supports the continuity of the Silungkang weaving tradition. Community empowerment, therefore, connects the economic development of local artisans with the preservation of this cultural practice (Melinda et al., [2021](#)).

The relatively small number of Silungkang weavers presents a challenge when compared with the increasing market demand for woven products. To address this condition, the Sawahlunto Cooperative, Industry, and Trade Office and the Sawahlunto City Textile Technical Implementation Unit (*UPTD*) have implemented a weaving training program since 2012. The program provides participants not only with weaving skills but also with a complete set of weaving equipment (Affendi, [1981](#)). These initiatives aim to increase the number of artisans and broaden the market reach of Silungkang songket. Training has also enabled communities to diversify production beyond traditional sarongs and fabrics to include clothing, accessories, and home decor products, thereby expanding the economic and creative applications of songket (Rodgers, [2011](#); Seprisyam et al., [2021](#)).

The Sawahlunto City Government also promotes Silungkang weaving through major cultural events that place songket at the center of public cultural expression. One prominent initiative is the annual *Sawahlunto International Songket Carnival (SISCA)*, which features a cultural parade showcasing diverse songket-based fashion creations in line with themes established by the organizing committee. Through this event, traditional weaving enters contemporary cultural spaces without losing its association with Sawahlunto's local heritage. *SISCA* also serves as a platform to promote heritage tourism rooted in local cultural traditions. The event consequently connects the preservation and promotion of Silungkang weaving with the broader development of Sawahlunto as a cultural tourism destination (Elfisha, [2024](#); Syafril, [2011](#)).

The Pintu Gerbang Sawahlunto area has also developed as a center for weaving craftsmanship through the establishment of weaving houses and a weaving village. Located near Muaro Kelaban, the area forms part of Sawahlunto's principal tourism development zone and provides a strategic setting for showcasing and promoting local weaving products. The development of these facilities has coincided with the rapid growth of retail outlets offering songket, sarongs, embroidery, and other woven products. This expansion reflects a significant increase in both production and market demand for local textiles (Utami, [2016](#)). The concentration of production, promotion, and commercial activities in this area strengthens the visibility of Silungkang weaving while supporting its continued presence within Sawahlunto's contemporary cultural and economic landscape.

Cultural Performances and Festivals

Beyond weaving-related festivals, the Ombilin Coal Mining Heritage of Sawahlunto also provides spaces for various cultural and artistic performances. According to the Indonesian government's 2021 report to UNESCO, communities may utilize components of the World Heritage property as venues for cultural and artistic activities. These activities include regional cultural weeks and the *Kuda Kepang Carnival*, which bring cultural expressions into spaces associated with Sawahlunto's mining heritage. The use of heritage components for such activities demonstrates how the former mining landscape continues to accommodate contemporary cultural practices. These performances also strengthen the relationship between Ombilin's physical heritage and the cultural life of the surrounding communities (Format for the Submission of State of Conservation Reports by the State Parties, [2021](#)).

Sawahlunto also draws upon its multi-ethnic cultural traditions to support tourism development. Communities have revitalized various artistic traditions associated with different ethnic groups, transforming them into cultural

attractions that complement the historical character of the old mining town. These traditions include *Kuda Kepang*, Javanese *wayang*, Sundanese *gamelan*, Minangkabau *randai*, and the Batak *tor-tor* dance. The development of mining-based tourism has brought renewed public attention to cultural expressions that had previously received limited recognition. Their revival illustrates how Sawahlunto's multicultural history continues to shape the intangible cultural heritage associated with the former mining community (Syafri et al., [2022](#)).

Efforts to develop cultural heritage tourism based on local traditions are also reflected in the organization of local, national, and international festivals. Sawahlunto regularly hosts the Multicultural Festival, Wayang Festival, Randai Festival, *Sawahlunto International Music Festival (Simfes)*, and other events included in the city's annual festival calendar. The frequency and diversity of these cultural events have led visitors and local communities to refer to Sawahlunto as the "City of Festivals." This designation reflects the prominent role that festivals have assumed in the city's contemporary cultural identity. These events simultaneously provide spaces for cultural expression and strengthen the visibility of Sawahlunto's diverse cultural traditions within its developing heritage-tourism landscape (Syafri et al., [2021](#)).

In 2023, the Directorate of Cultural Development and Utilization (*PPK*) under the Directorate General of Culture of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia launched the *Gelanggang Arang* initiative. The program officially began on 19 October 2023, in Padang and subsequently continued at eight other locations within the Ombilin Coal Mining Heritage of Sawahlunto zone. The organizers continued the initiative in 2024, beginning that year's series of activities on 4 May 2024, and again conducting events at several locations. The Directorate General of Culture developed *Gelanggang Arang* in collaboration with various stakeholders, including local communities, to support the preservation and protection of the Ombilin heritage ecosystem, particularly its cultural ecosystem. The initiative, therefore, connects institutional heritage preservation with community participation across different components of the World Heritage landscape (*Gelanggang Arang Sawahlunto, WTBO Activation and Celebration of Sawahlunto City's Anniversary*, [2023](#)).

Gelanggang Arang adopts a different theme each year to frame its cultural activities and engagement with World Heritage. In 2023, the initiative carried the theme "Children of the Village Celebrate World Heritage" (Format for the Submission of State of Conservation Reports by the State Parties, [2021](#)), while the 2024 program adopted "Children of the Village Care for World Heritage." Its activities include exhibitions, workshops, food bazaars, traditional artistic performances representing various ethnic groups, and public dialogues. Information from the Instagram account of the Regional Cultural Preservation Office III also indicates that the *Gelanggang Arang* program includes a writing competition. Through these activities, *Gelanggang Arang* provides a platform for cultural participation while supporting public engagement with the preservation of the Ombilin Coal Mining Heritage of Sawahlunto (Armis & Kanegae, [2021](#); *Gelanggang Arang Sawahlunto 2024: 5 Years of WTBO Commemoration*, [2024](#)).

Threats to the Ombilin Coal Mining Heritage of Sawahlunto

Development Pressure

Development pressure poses a significant challenge to the integrity of several components of the Ombilin Coal Mining Heritage of Sawahlunto. New residential and community buildings have emerged adjacent to or within historic complexes in Area A, including the Pandjang Mining Complex, Soengai Doerian Mining Complex, Coal Processing/Screening Complex (*zeefhuis*), and workers' housing complex. The introduction of new structures and facilities within these historic settings can alter the spatial character and compromise the integrity of the heritage site. Similar pressures occur along the railway tracks and around train stations in Area B, particularly near Padang Pandjang Station, where residential development has expanded close to the railway infrastructure. Although regulations require a minimum distance of six meters between buildings and railway tracks, many houses stand less than three meters from the tracks (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Adaptation of historic buildings to contemporary functions creates another form of development pressure. In Area A, the Kubang Sirakuak Power Plant was substantially altered when it was converted into the Nurul Iman Mosque in Sawahlunto, leaving only the underground bunker and smokestack of the original structure. The addition of incompatible components, inappropriate building uses, and improper replacement of original materials can diminish the integrity of heritage attributes. Similar changes have occurred in the Tangsi Baru workers' settlement, where

residents have subdivided houses and rooms into smaller units to accommodate a growing population, while several buildings in the Coal Processing Plant Complex now function as offices for the local Tourism Office. Development pressures also include plans to expand Sawahlunto Hospital through the addition of wards and facilities, and to replace some railway ties along the Padang–Sawahlunto route in Area B with concrete ties (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

These examples demonstrate that development pressure involves both the construction of new structures within historic settings and the physical adaptation of existing heritage assets for contemporary purposes. Residential expansion may affect the spatial relationship between heritage components, while functional conversion can alter original structures, materials, and architectural characteristics. Changes to railway infrastructure similarly demonstrate the tension between maintaining functional requirements and retaining historic material. The continued use of these places, therefore, requires careful attention to alterations that may affect the integrity of the attributes for which the property is recognized. Development pressure consequently poses a preservation challenge for both the built environment and transportation infrastructure within the Ombilin heritage landscape.

Environmental Pressures: Climatic Conditions and Natural Disasters

Climatic conditions also affect the physical preservation of heritage components in Area A. High humidity encourages the growth of moss and mold on cultural heritage buildings, while wild vegetation and shrubs around the structures can damage their physical integrity. The Compressor Building provides a clear example, as a banyan tree has partially obscured the structure and its trunk has penetrated and damaged one side of the wall. Climatic exposure also contributes to the corrosion of iron and steel components used throughout the mining infrastructure. These conditions demonstrate the vulnerability of historic building materials and industrial structures to prolonged environmental exposure.

Environmental deterioration also affects the railway infrastructure in Area B and the port-related structures in Area C. Rainfall, humidity, temperature, water exposure, and microorganisms contribute to the deterioration of wooden railway bridges and railway ties in Area B. In Area C, the coastal environment surrounding Gunung Silo near Bayur Bay exposes heritage structures to persistent sea winds that damage iron structural components. Concrete deterioration is also visible across areas containing buildings and mining infrastructure. These environmental conditions collectively place continued pressure on the physical materials and structural condition of the heritage components (Management Plan Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Natural and Human-Caused Disasters

Natural and human-induced disasters pose significant threats to the preservation of the Ombilin Coal Mining Heritage of Sawahlunto. In Area A, the center of Sawahlunto remains vulnerable to flash floods due to its proximity to the Lunto River and its geomorphological position in a valley. Historical records indicate that several floods occurred during the Dutch colonial period, affecting the Tangsi Baru and Pasar settlements. Risk-reduction measures include river dredging, the construction of levees, and the protection of areas near the river's upper reaches from uncontrolled land use, particularly to reduce damage during periods of heavy rainfall. Area B faces similar hydrological risks, as the Anai River experienced a flash flood in 1892 and another major flash flood in May 2024 (Haryanto, [2024](#)).

Fire poses another potential threat, particularly in the densely populated parts of Area A. The concentration of residential buildings in Tangsi Baru and commercial premises around the market increases their vulnerability to fire hazards. Many houses and shops use wood and sheet metal as primary construction materials, further increasing the potential consequences of a fire. The close spatial relationship between these settlements and heritage components means that fire could affect not only residential and commercial properties but also the broader historic environment. Fire prevention, therefore, constitutes an important aspect of risk management within the Sawahlunto heritage landscape.

Sawahlunto's geographical position within a valley surrounded by rocky hills also exposes Area A to landslide hazards. A landslide at Puncak Polan in 2014 damaged several buildings and demonstrated the vulnerability of the urban landscape to ground movement. Authorities subsequently implemented preventive measures by constructing landslide barriers at Puncak Polan. They also installed a landslide warning system to detect ground movement and provide early alerts. These interventions seek to reduce the potential impact of future landslides on buildings and other components

of the heritage landscape (Management Plan Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Landslide risks also extend beyond Sawahlunto City to Areas B and C. In Area B, the 155-kilometer railway connecting Sawahlunto with the coast traverses steep hills, including terrain reaching approximately 773 meters above sea level around Padang Panjang, as well as mountains, deep canyons, rivers, and the Anai Valley. These geographical conditions make sections of the railway particularly vulnerable to landslides if the surrounding forests are not adequately protected. Area C faces a comparable threat because a cliff rises above the Coal Storage Facility (*Silo Gunung*), posing risks of rockfalls and slope failures. This vulnerability became evident in 2017, when a landslide caused several metric tons of rock to fall onto the site (Nomination Dossier for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto, [2017](#)).

Earthquakes and tsunamis constitute additional disaster threats to components of the Ombilin Coal Mining Heritage of Sawahlunto. The Coal Storage Facility (*Silo Gunung*) at Emmahaven Port, now Teluk Bayur Port, in Area C, is located on the western coast of Sumatra, facing the Indian Ocean, and is therefore vulnerable to tsunami hazards. Although the other areas do not face the same tsunami risk, earthquakes remain a potential threat because Sumatra lies within the *Ring of Fire* and contains numerous active volcanoes. West Sumatra has experienced several earthquakes exceeding magnitude 5 on the Richter scale, including the highly destructive 2009 earthquake. An earlier earthquake in 1926 also caused damage in West Sumatra, as illustrated by the historical image of damage to Padang Panjang Station in Area B presented below.

CONCLUSION

The Ombilin Coal Mining Heritage of Sawahlunto encompasses an interconnected system of tangible and intangible cultural heritage. Its tangible heritage consists of twelve components and twenty-four attributes distributed across Areas A, B, and C, including mining sites, transportation systems, and supporting facilities. In contrast, its intangible heritage reflects the multicultural society that developed alongside the mining industry, through language, traditional arts, weaving, cultural performances, and festivals. The study identifies three principal categories of preservation threats: development pressure, environmental deterioration, and natural or human-induced disasters. Development and functional adaptation may affect the integrity of historic structures and infrastructure, while humidity, vegetation, corrosion, and other environmental conditions contribute to the physical deterioration of heritage components; floods, fires, landslides, earthquakes, and tsunamis create additional risks across the three areas. These combined pressures demonstrate that the sustainability of Ombilin depends on preserving not only its physical components but also the cultural ecosystem that gives the former mining landscape its continuing social and cultural significance.

Future preservation efforts should address the identified threats based on the characteristics and vulnerabilities of each component in Areas A, B, and C. Management should pay particular attention to development activities and functional adaptations within historic complexes, as inappropriate alterations, incompatible construction, and changes to original materials may compromise the integrity of heritage attributes. Regular attention to environmental deterioration is equally important, as humidity, vegetation growth, corrosion, rainfall, coastal exposure, and other conditions continuously affect buildings, railway infrastructure, and port facilities. Disaster-risk considerations should also remain integral to preservation efforts, particularly in locations exposed to floods, fires, landslides, earthquakes, and tsunamis. At the same time, continued community participation in maintaining the Tansi language, Silungkang weaving, traditional arts, cultural performances, and festivals can support the continuity of the intangible cultural heritage associated with the mining landscape.

The management of the Ombilin Coal Mining Heritage of Sawahlunto should integrate the preservation of tangible heritage, intangible cultural heritage, environmental conditions, and disaster risks within a coordinated heritage-management approach. Development within or near heritage components should receive careful attention to ensure that contemporary needs do not undermine the integrity of historic buildings, railway infrastructure, mining facilities, and their surrounding settings. Preservation measures should also address documented environmental and disaster-related vulnerabilities through appropriate maintenance, preventive actions, and risk-reduction measures, while continuing existing efforts to safeguard cultural traditions through community participation, cultural events, and intergenerational transmission. Collaboration among government institutions, heritage managers, and local communities can strengthen the relationship between the conservation of physical assets and the continuity of

Sawahlunto's cultural practices. Such an integrated approach can support the long-term sustainability of the Ombilin heritage landscape as both a physical legacy of coal mining and a living cultural ecosystem.

REFERENCES

- Operational Guidelines for the Implementation of the World Heritage Convention. (2012).
- Aditiawarman, M., & Novita, B. (2024). An Analysis Pragmatics of Tangsi Language in The Sawahlunto Social Structural Approach. *Jurnal Ilmiah Langue and Parole*, 7(2), 42–47. <https://doi.org/10.36057/jilp.v7i2.662>
- Affendi, Y. (1981). *Seni Tenun Silungkang dan Sekitarnya*. Direktorat Jenderal Kebudayaan Departemen Pendidikan dan Kebudayaan.
- Armis, R., & Kanegae, H. (2020). The Attractiveness of a Post-Mining City as a Tourist Destination from The Perspective of Visitors: A Study of Sawahlunto Old Coal Mining Town in Indonesia. *Asia-Pacific Journal of Regional Science*, 4(2), 443–461. <https://doi.org/10.1007/s41685-019-00137-4>
- Armis, R., & Kanegae, H. (2021). Regional Competitiveness of a Post-Mining City in Tourism: Ombilin Coal Mining Heritage of Sawahlunto, Indonesia. *Regional Science Policy & Practice*, 13(6), 1888–1911. <https://doi.org/10.1111/rsp3.12404>
- Asoka, A., Samry, W., Zubir, Z., & Zulqayyim. (2017). *Sawahlunto Dulu, Kini, dan Esok: Menjadi Kota Wisata Tambang yang Berbudaya*. Lembaga Pengembangan Teknologi Informasi dan Komunikasi Universitas Andalas.
- Elfisha, M. (2024). *Kemendikbudristek Kembali Gelar Gelanggang Arang Jaga WTBOS di Sumbar*. <https://www.antaranews.com>.
- Fitriawan, D., Senov, H. T., & Permana, R. (2020). Pemanfaatan Teknologi Foto Udara Penginderaan Jauh Unmanned Aerial Vehicle (UAV) Untuk Pengumpulan Data Geospasial Di Area A Warisan Dunia Tambang Batubara Ombilin Sawahlunto (WTBOS). *Jurnal Azimut*, 3(01), 37. <https://doi.org/10.31317/jaz.v3i01.656>
- Format for The Submission of State of Conservation Reports by The State Parties. (2021).
- Galanggang Arang Sawahlunto 2024: 5 Tahun Peringatan WTBOS. (2024). <https://www.kemdikbud.go.id/Main/Blog/2024/07/Galanggang-Arang-Sawahlunto-2024-5-Tahun-Peringatan-Wtbos>
- Galanggang Arang Sawahlunto, Aktivasi WTBOS Sekaligus Meriahkan HUT Kota Sawahlunto. (2023).
- Haryanto, B. (2024). *Lembah Anai: Pesona Alam, Banjir Bandang dan Jalur Eksotis Kereta Api*. <https://www.kidalnarsis.com/2024/05/jembatan-kereta-api-lembah-anai.html>
- Hendrawan, M. R. (2026). Dari Silo Menuju Sinergi: Memotret Peluang Konvergensi Institusi Memori pada Warisan Tambang Batubara Ombilin Sawahlunto. *Puitika*, 20(3), 225–263. <https://doi.org/10.25077/puitika.v20i3.628>
- Management Plan Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto. (2017).
- Managing Cultural World Heritage. (2013).
- Melinda, S., Fitlayeni, R., & Ariesta, A. (2021). Pemberdayaan Masyarakat Pengrajin Songket Silungkang di Kota Sawahlunto, Sumatera Barat. *Jurnal Socius: Journal of Sociology Research and Education*, 8(2), 113. <https://doi.org/10.24036/scs.v8i2.319>
- Namira, A. T. (2024). Dari Kota Terpencil menjadi Kota Tambang Dunia: Gelora Membara Mengelola Bersama Warisan Tambang Batubara Ombilin Sawahlunto (WTBOS). In *Artikel Pilihan Galanggang Arang WTBOS*. Balai Pelestarian Kebudayaan Wilayah III Sumatera Bara.
- Nomination Dossier Nomination for Inscription on the World Heritage List: Ombilin Coal Mining Heritage of Sawahlunto. (2017).
- Perdiana, V., & Mubarak, A. (2022). Pengembangan Warisan Budaya Tambang Batubara Ombilin Kota Sawahlunto. *Jurnal Manajemen Dan Ilmu Administrasi Publik (JMIAP)*, 209–216. <https://doi.org/10.24036/jmiap.v4i3.299>
- Pujianti, S. (2010). *Perjuangan Kaum Buruh Tambang Batubara Ombilin Sawah Lunto: Dari Persatoean Kaoem Boeroeh Tambang (PKBT) Hingga Vereeniging Boemipoetra Staatspoor, Tramwegen, Oblilinmijnen en Landsautomobiendiensten op Sumatra (VBSTOL) 1925-1934*. Universitas Indonesia.
- Rachman, A., Yochanan, E., & Samanlangi, A. I. (2024). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. CV Saba Jaya Publisher.
- Rodgers, S. (2011). Textile Commerce and Songket Creativity: The Role of Heritage Entrepreneurs in Contemporary Gold-thread Weaving in Sumatra. *Textile*, 9(3), 352–371. <https://doi.org/10.2752/175183511X13173703491153>
- Seprisyam, S., Hasanuddin, H., & Pramono, P. (2021). Komodifikasi Songket Silungkang dalam Pengembangan Pariwisata di Kota Sawahlunto. *Jurnal Ilmu Budaya*, 9(2), 161–172. <https://doi.org/10.34050/JIB.V9I2.14526>

- Sudarmoko, S., & Putra, H. J. (2026). Warisan Tambang Batu Bara Ombilin-Sawahlunto: Empat Tahun Setelah Penetapan Warisan Dunia dan Ingatan Kolektif Lainnya. *Puitika*, 20(3), 10–34. <https://doi.org/10.25077/puitika.v20i3.618>
- Syafril, E. P. E. (2011). *Menggali Bara Menemu Bahasa*. Pemerintah Kota Sawahlunto.
- Syafril, E. P. E. (2019). Community Social Change and Decreolization Threat of Tansi Language in Sawahlunto. *International Conference on Communication, Language, Education, and Social Sciences (Cless 2019)*.
- Syafrini, D., Nurdin, M. F., Sugandi, Y. S., & Miko, A. (2021). Transformation of a Coal Mining City into a Cultured Mining Heritage Tourism City in Sawahlunto, Indonesia: A Response to the Threat of Becoming a Ghost Town. *Tourism Planning and Development*, 19(4), 296–315. <https://doi.org/https://doi.org/10.1080/21568316.2020.1866653>
- Syafrini, D., Nurdin, M. F., Sugandi, Y. S., & Miko, A. (2022). Transformation of a Coal Mining City into a Cultured Mining Heritage Tourism City in Sawahlunto, Indonesia: A Response to the Threat of Becoming a Ghost Town. *Tourism Planning & Development*, 19(4), 296–315. <https://doi.org/10.1080/21568316.2020.1866653>
- Utami, O. R. (2016). *Studi Kain Songket Silungkang*. Universitas Negeri Jakarta.
- Wimra, Z., Nasir, M., & Bunaiya, M. (2026). Madrasah, Surau, dan Pasar Sepanjang Jalur Kereta Api Kawasan Warisan Tambang Batu Bara Ombilin Sawahlunto. *Puitika*, 20(3), 187–208. <https://doi.org/10.25077/puitika.v20i3.626>
- Zubir, Z. (2018). *Pertempuran Nan Tak Kunjung Usai: Eksploitasi Buruh Tambang Ombilin oleh Kolonial Belanda 1891-1927*. Andalas University Press.