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ARTICLE

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

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Abstract

Mining has been a basis of development for industrial societies. A mining city was an engine of economic growth for a region by providing employment and gaining revenue from the mining industry. Nevertheless, in the post-mining period, a city such as this suffers from a lot of problems inherited from the mining era, ranging from economic incapability, social structure change, and environmental degradation. Transforming mining-heritage values for tourism applications has become a prevalent choice for many post-mining cities around the world. The attractiveness of mining-related resources is one of the determinants in the success of tourism development in these cities. This study measures the attractiveness of tourism resources within a smaller post-mining city from the perspective of the visitors. Twenty-two types of resources are identified and categorized into three groups: core resources, created resources, and supporting resources. Questionnaire surveys were distributed to 100 random visitors in Sawahlunto, an old coal mining city in Indonesia. Using a five-point Likert scale, these measured the levels of attractiveness respondents had for each resource. Study results reveal that natural beauty, mining heritage sites, museums, and architectural features are the most attractive resources found in a post-mining city by visitors. These resources become the primary motivation for their visit. It also confirms that visitors will likely arrange return trips in the future.

Keywords Post-mining potential · Mining heritage tourism · Resource attractiveness · Destination competitiveness

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1 Introduction

Reestablishing cities can be a challenging process for many former mining sites in the Asia–Pacific region. During the industrial revolution era, mining cities often functioned as source of economic growth and center of welfare. At that time, steam engine technology was employed for various industrial projects, resulting in an enormous demand for energy production. The primary available energy resources came from non-renewable materials, such as coal. Nevertheless, as a result of global energy market changes, clean and low carbon energy policy, and industrial technological changes, many mining cities experienced complete mineral production shutdowns. Additionally, the cities faced economic, social, and environmental problems including loss of revenue, unemployment, outmigration, and environmental degradation (Müller et al. 2005; Wirth et al. 2012).

Determining urban regeneration policies for former mining cities has become a crucial issue since most of these locations lack economic alternatives for new development. One of the most common preferences in the post-mining era is the repurposing of mining-related materials for touristic attractions. The rationale is to offer their unique mining history and tangible heritage as the main tourism product to the visitors. However, the "tourism after mining" strategy does not always end with success. In 2007, Iwami Ginzan, a former silver mine city in northwest Japan, was registered as the first UNESCO World Heritage Site (WHS) in Asia for the post-mining city category (UNESCO 2007). At the same time, Yubari City in Hokkaido suffered bankruptcy, the first and the only case in Japan—even though the city's government heavily invested in converting the mining town to be a tourist center (Hattori et al. 2017). These two contradictory outcomes proved that post-mining cities should have sustainable tourism development strategies to enhance their competitive advantages in the tourism arena.

Transforming post-mining city into tourism would require full commitment and participation from all the stakeholders in preserving their mining heritage value and providing exceptional service for the visitors. Moreover, the strategic tourism development plan entails extra efforts in changing visitor's minds towards "black image" of post-mining sites. Recognizing visitors' perceptions is one of the dimensions in destination attractiveness and competitiveness. The number of visits will depend on the match between tourist preferences and the perceived products or offered services (Dwyer and Kim 2003).

This study aims to analyze the appeal of tourism resources in a former coal mining city in Indonesia, namely Sawahlunto. To achieve this objective, this research measures the significance of eleven groups of core resources and attractors, including natural beauty, cultural heritage, tourism infrastructure, special events, the ranges of activities, entertainment, shopping, general infrastructure, quality of services, accessibility, and hospitality in generating visits. Considering visitors' preferences towards these resources is important for the development of tourism products and services. On the one hand, some traditional features offered by post-mining cities may attract visitors, but tourist preferences could also work in reverse and actually influence the types of products and services a city may choose to develop.

2 Theoretical background

2.1 Urban regeneration in a post-mining city

A mining city is one whose development is dominated by mining, a primary industry that involves the extraction and processing of minerals and other geological materials (Martinez-Fernandez et al. 2012). More specifically, a mining community is a settlement that evolves near a mining site and is where most of the mine workers live (Dale 2007). The population is significantly affected by the nearby mining operation (Veiga et al. 2001). These definitions imply that there is a relationship between the mining industry and the community's well-being. Mining communities are often dependent on the facilities and infrastructure developed through local mine. In many mining sites in Asia, much of the roads and transportation networks, water and sanitation services, housing, hospitals, and schools were established through mining activities (World Bank and International Finance Corporation 2002). These facilities later were privatized by the government after the mine closure.

Mine closures have been a global phenomenon since the 1990s. In China, about 40,000 illegal small-scale coal mines and over 250 state-owned coal mines were closed in the year 2000 alone (Ellis 2002). The latest World Bank data in 2018 show that China doubled its coal production from 1833 million tons in 2000–3210 million tons in 2016, account for 44% of total global coal production. India and Indonesia also experienced a significant increase, and they account for 10% and 6% of the global production, respectively. Although made up 60% (about 4.4 billion tons) of total global production, these countries are likely to be most impacted by future coal mine closures. Downsizing or closures in the coal industry are mainly due to three drivers (World Bank Group 2018): the global energy market, clean energy policies, and coal mine mechanization. Regarding the first driver, the demand and price of mined resources are determined by global markets that tend to be volatile. Second, policy interventions have prevented local and regional air pollution by introducing clean, low carbon energy. The final driver is related to technical improvements in coal extraction methods and technologies resulted in the loss of mine jobs.

The impacts of mine closures in the affected cities have been quite similar though the declines took place under different conditions (Harfst 2015). When mining leaves a community, there are invariably negative impacts, including the economic, social, and environmental dimensions depicted in Table 1. The most notable impacts are the decline in economic activity and disappearance of skills, knowledge, and innovation. Talented labor forces with skills in mining leave for a better life in new and prosperous cities. While mining corporations build networks of global knowledge, mining cities remain isolated from the flow of that knowledge. Once the mines are no longer profitable and their operations have ceased, mining corporations can simply bring their financial capital to new and promising sites in their networks, leaving mining cities with resultant social problems, such as high unemployment rates, limited education, lower purchasing power, and a

Table 1 Impediments to development in old industrialized (Harfst 2014)

Dimension	Features
Economic	Monostructures, value creation below national average
Social	High unemployment rates, low educational background
Environmental	Environmental damages, altered landscape
Demographic	Shrinkage, outmigration, high percentage of elderly people
Image	"Black" image
Additional factors in regions with small- and medium-sized towns	Declining economic and functional importance
	Low organizational capacities
	Low political attention

lower standard of living (Martinez-Fernandez et al. 2012). Mine closures are also accompanied by the discovery of hazardous environmental degradation at former production sites (Bridge 2004). This includes abandoned surface mines, a lowered groundwater level, contaminated sites, and degraded landscapes. Additionally, post-mining cities are burdened by defunct mining facilities and over-sized and derelict infrastructure. The remediation of these sites is seldom undertaken because of unclear property rights and limited funding. Overall, these unfavorable scenario lead to the perception of post-mining cities as unlivable places of decay and disinvestment saddled with bleak environmental images, thus impeding new investment or new industry.

Restructuring efforts are harder for small- to medium-sized cities (Harfst 2014). Unlike major post-mining cities, these cities often face additional handicaps, such as low organizational capacities and inadequate attention or political support from the national government. The successful redevelopment of mining infrastructure in small towns depends primarily on the ability to win funding from the national government (Su and Lin 2014). One of the most prominent evidence takes place in Yubari, a historical coal mine city in Hokkaido Island, Japan. Since 1892, coal mining industries had been the primary economic resource of the city. In 1990, the city was transforming the local economy from coal industry to mining heritage tourism. However, it attracted public attention in 2007 due to its bankruptcy, the first and the only case in Japan. The failure of Yubari was the combination of high local public debt (more than 63 billion Yen in 2006) and the refusal of Japan national government to bail it out (Ferilli et al. 2015).

Previous studies in post-mining cities proposed the importance of diverse drivers in the transformation process, such as adaptability and resilience to structural changes (Lintz et al. 2012), local development actors (Dolzblasz 2012), participation of youth in regional development (Marot and Cernic-Mali 2012), the revitalization and preservation of heritage mining features (Lenartowicz and Ostrega 2012), and the concept of green infrastructure to transform former coal mining sites (Wirth et al. 2018). Some studies emphasize the utilization of mining heritage in tourism: the role of ecotourism and geo-heritage in the spatial redevelopment (Horvath and Csullog 2012), the introduction of strategic destination management in mining

heritage tourism (Pizzera and Osebik 2012). The collaboration between players with practical knowledge and mining practitioners can provide a new, creative, and innovative project drawing on empirical knowledge from different theoretical perspectives. A great number of mining cities and regions across the globe have been accompanied by academic partners and the regional financial body in the transformation period. Among the well-known, comprehensive regional successes are the International Building Exhibition's Emscher Park in the Ruhr District of Germany, which was built from 1989 to 1999. Another successful project is "ReSources-the utilization of post-mining potentials for sustainable redevelopment in Central European mining cities and regions" from 2009 to 2012, which was co-funded by the European Regional Development Fund and rural development funds (Wirth et al. 2012; Harfst 2015).

Despite unpromising situations, the regeneration of post-mining cities is not an impossible job. Affected cities or regions have actively utilized their post-mining potential as a steppingstone to different future in different scenarios. Post-mining potentials are defined as legacies, leavings, remains, and residues of mining that have a number of broader uses and contribute to the success of structural change (Wirth et al. 2012). Literature on post-mining potentials categorizes them into two groups: natural and cultural, or natural and human-made, attractions in heritage tourism (Jolliffe and Conlin 2011). "Natural potentials" refers to changes in landscapes or their components: water, soil, flora, fauna, reliefs, etc. These potentials include ecological aspects, natural resources, and natural heritage. At the Granny Smith Goldmine in Australia, former open mining pits are transformed into fish farms to maintain environment sustainability (Otchere et al. 2004). Likewise, former coal mining landscape is converted into a leading ski resort in Akabira (Hokkaido Island, Japan). Meanwhile, in Ha Long Bay Vietnam, it is transformed as a recreational area (Cuong et al. 2011). The latest comprehensive efforts on the utilization of abandoned mine take place in Changsha China. The Dawangshan Pit, an opencast limestone quarry with over 40-year mining history, has been converted into a five-star hotel and theme park through the Intercontinental Shanghai Wonderland Hotel (ISWH) project and the Ice World and Water Park (IWWP) project (Tan et al. 2019). These projects are estimated to be completed in 2019. "Cultural potentials" refers to the artificial products of mining, such as buildings, infrastructure, mine shaft and intangible products such as miner's tradition. The Sunway Lagoon City in Malaysia converts mining sites as a center of education, health, and social services. Similarly, the Ok Tedi mine in Papua New Guinea provides the best medical facilities in the region. In Japan, many post-mining sites stand as a living museum, for example, Iwami Ginzan silver mine, Gunkanjima, and the Sado gold mines.

2.2 Mining heritage and tourism

Mining tourism, which in some previous studies was considered as a part of industrial tourism (Falser and Yang 2001; Orange 2008), is a form of tourist activity in active or post-mining sites. It is continually recognized as a future economic engine for post-mining cities focusing on the utilization of both tangible and intangible

forms of mining heritage, which can include buildings, defunct mining infrastructure, abandoned mining landscapes, mining souvenir products, mining traditions and customs, and mining knowledge or skills. A city's distinct characteristic and exclusive history can be repackaged as a tourism product and service. Różycki and Dryglas (2017) specified that a post-mining city is a perfect place for people to escape their day-to-day problems, as they can regenerate their physical and mental strength, improve health and fitness, and deeply relax in an unusual place. At a mining site, a visitor can examine stereotypes and misconceptions about working in a mining environment, including those related to its safety measures and methods of operation. Poria et al. (2004) classified the specific reasons for visiting heritage sites into the following categories of interest: having a heritage experience, learning history, and having a recreational experience. Tourists who identify a heritage experience as their motivation for travel tend to gain experience from cultural artifacts. Those who pursue a learning experience are characterized by the desire to study the past from observations made at historical sites, while those motivated by a recreational experience visit historical sites for leisure. The abovementioned motivations underline that the success of mining heritage tourism is influenced by tourists' perceptions of the significance and value of that heritage.

Built heritage is an important backbone of many sectors including tourism and travel, which are significant drivers of economic activity drawing in domestic and international tourists (Franco and Macdonald 2018). The utilization of mining heritage in tourism aims to foster economic and cultural value for both the visitors and the local mining community by generating new revenue streams. Economic values are expressed in financial terms, such as income generation, number of jobs created, and tax revenues, whereas cultural values are related to esthetics, spiritual qualities, and the historical significance of the site. Table 2 describes the construction of mining heritage value from six components.

All of the abovementioned values are acquired from the buildings used for mining production and supporting infrastructure for mining industries. These heritage features are often abandoned once mining ceases. Thus, the rehabilitation of post-mining potentials has to be integrated into the strategic development plans and must guarantee four aspects (Mendes 2013). First, all mining industry legacies must display a sufficient esthetic of deindustrialization to make the post-mining site

Table 2 Construction of mining heritage value in tourism. Adapted from Throsby (2009)

Value	Features
Esthetic value	Visual beauty of the old buildings, former mining infrastructures and sites
Spiritual value	The significance of mining heritage in providing understanding or in representing religious mining tradition
Social value	The role of mining heritage in forming cultural identity or a sense of togetherness with other community members
Historical value	Connectivity of mining heritage with the past
Symbolic value	Mining heritage feature or sites as repositories or conveyors of meaning
Authenticity value	The uniqueness of visiting mining heritage features

attractive. Edwards and i Coit (1996) proposed a typology for choosing sufficiently attractive mining sites as industrial heritage attractions: productive attractions, processing attractions, transport attractions, and social–cultural attractions. Productive attractions consist of either surface or underground mining sites, open pit or open mountainside quarries, and tunnels or deep shafts. Processing attractions are related to site-based or site-serving facilities, while transport attractions include underground and site tours by train or tramcar. Social–cultural attractions are associated with the miners' settlements and villages, social support infrastructure, local markets, green space, education and health-care facilities, and administrative offices. The second aspect involves creating local and regional business initiatives to promote sustainable mining heritage and incorporating other diversified and productive activities in the cities. The third aspect deals with the environmental remediation of mining landscapes commonly thought of as polluted and degraded lands. Lastly, the fourth aspect underlines the importance of creating strong publicity to improve public awareness.

The preservation and conservation of mining heritage assets are concurrent with the expansion of the United Nation's World Heritage Site (WHS) designations into industrial heritage areas. WHS designation is seen as a validation of a mining site or city's heritage value. Consequently, the designation will lead to increased tourist traffic, generate additional revenue, and encourage site stewards, thereby benefiting the economies of the affected cities or countries (Rodwell 2012; Su and Lin 2014). Thus, it is not surprising that many former mining sites or cities are able to transform into famous tourist destinations, including Zollverein in Germany (2001), Iwami Ginzan Silver Mine site in Japan (2007), and mining sites in Japan's Meiji Industrial Revolution (2015). In addition, many regard the United Nation's Educational, Scientific, and Cultural Organization's (UNESCO) WHS designation as the most effective international legal instrument for the protection of cultural and natural heritage (Frey et al. 2013).

2.3 Destination attractiveness and competitiveness

A destination's main appeal is its attractiveness, and it must use this to draw visitors. It is associated with the visitors' feelings and opinions about the destination's perceived ability to satisfy their needs (Vengesayi 2003). The attractiveness of a destination or city can be based on exogenous factors such as climate, proximity to mountains and oceans, and other natural resources, or endogenous human-made lifestyle amenities (Broxterman et al. 2019). Moreover, cities with more historic landmarks, an abundance of parks, and fewer hazardous sites are perceived as more attractive (Carlino and Saiz 2019). The distinctive experience and satisfaction offered by a destination could contribute to the key motivation tourists have to visit, and it could become an important attribute for a location to excel in its competition with other locations. In mining tourism, the main attractor is generally split into four categories, as listed in Table 3.

Meanwhile, the competitiveness of tourism destinations is related to their ability to increase tourism expenditures and attract visitors while providing them with

Table 3 Mining tourism attractors (Jolliffe and Conlin 2011)

Natural	Human-made not originally designed primarily for visitation	Human-made and purpose built for visitation	Special events
Caves	Mines	Mining theme parks	Mining festivals
Rock faces	Quarries	Mining museums	Mining commemorations
Landforms	Mining railways	Mining open air museums	Mining anniversaries
	Mining communities	Mining community museums	
	Mining ghost towns	Mining interpretation centers	
		Mining routes	

satisfying, memorable experiences, and to do so in a profitable way while enhancing the well-being of the cities' residents and preserving the natural capital of the destination (Ritchie and Crouch 2003). It is also connected to the management of a destination, its ability to develop effective branding as a strategy to attract more visitors (Uysal et al. 2000), and its ability to create value-added products that sustain resources while maintaining a market position relative to other competitors (Hassan 2000). Tourism changes the composition of the local economy where cities with a higher number of tourists have a large number of service varieties and higher prices for service goods (Lanzara and Minerva 2019). The broad definition of destination competitiveness generally involves economics, attractiveness, satisfaction, and an element of sustainability (Novais et al. 2018). Traditional views regard the economic factor as the main feature of destination competitiveness, and it is simply quantitatively measured by the number of visitors, employment opportunities, and tourist expenditures during their visit.

Dwyer and Kim (2003) developed an integrated destination competitiveness model that considered demand conditions as an important factor (Fig. 1). It also

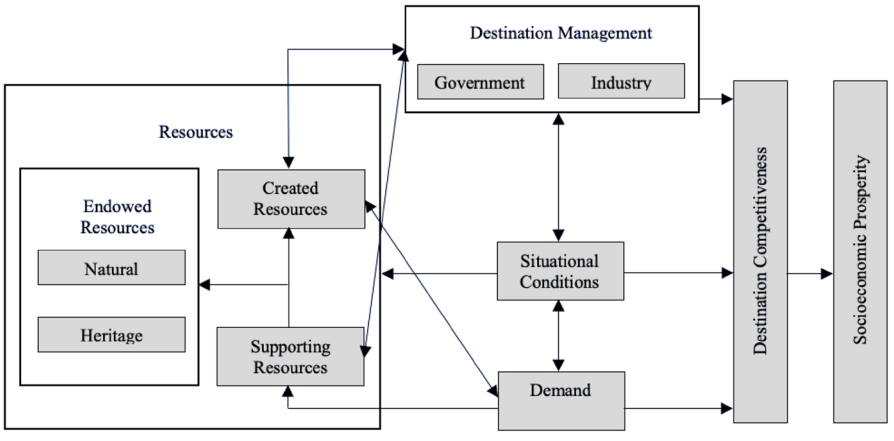


Fig. 1 Destination Competitiveness Model (Dwyer and Kim 2003)

recognized that destination competitiveness is not an ultimate end of policy-making but an intermediate goal toward the objective of regional or national economic prosperity. This model identifies four key determinants of destination competitiveness: resources, destination management, situational conditions, and demand conditions. This study focuses on the two-directional relationship between resources and demand conditions. This means that created resources and supporting resources influence demand, while at the same time, tourist preferences and motivations influence the type of products and services a destination will develop.

Resources are the fundamental reasons that prospective visitors choose one destination over another (Crouch and Ritchie 1999). They are classified into core resources and supporting resources. Core resources are further categorized as endowed (inherited) and created. Endowed resources can be natural and cultural, while created resources include tourism infrastructure, special events, ranges of available activities, entertainment, and shopping. In addition, supporting resources exert more of a secondary effect by providing a firm foundation upon which a successful tourism industry can be established. They are comprised of general infrastructure, quality services, destination accessibility, hospitality, and market ties to larger tourism market.

Destination management reinforces a location's competitiveness by building effective communication between tourism stakeholders, which means promoting a good image and destination brand, formulating appropriate policies, planning development, cultivating human resources through education and training, and regularly monitoring the impact of tourism on the environment.

Situational conditions, which make up the third component, relate to the surrounding environment including the location of the destination, the competitive environments, security and safety, and price competitiveness. The final component, which the model identifies as the importance of demand conditions, consists of awareness, perceptions, and preferences. The images of these destinations in visitors' minds, as well as visitors' awareness of their products and services, affects visitors' decision-making. Moreover, the congruence of visitor preference with a destination's product and service offerings directly affects the actual number of visits. This interrelationship is the motivation behind this research.

2.4 Sawahlunto old coal mining town

Sawahlunto was coal mining town since 1882 and was the oldest coal mining town in Southeast Asia. Located on the western side of Sumatera Island in an area of 273.45 km^2, the city was initially a rural area mostly consisting of forestlands and agriculture. Coal exploration was conducted by the Dutch Indies Company because of the demand for fossil energy resources during the Industrial Revolution in Europe in the late eighteenth century. Coal mining urbanized Sawahlunto's rural landscape and turned it into an industrial area, generating commercial and trading centers, settlement areas, and health facilities. Additionally, it fostered infrastructure development in the West Sumatera region, particularly the railway network and Emmahaven

harbor, which were used for transporting coal from Sawahlunto to the outer world, mainly Europe.

Over the next 100 years, Sawahlunto experienced ups and downs in its coal production, and in the late 1990s, the industry came to an end. Across the world, the restructuring of economies, fluctuating mineral market demands, technological changes, and political situations contributed to the decline of the coal industry in 1990. Finally, in 2000, PT. Bukit Asam, an Indonesian state-owned company that managed coal and mineral exploration in Sawahlunto, officially terminated all mining activities in the region. The end of coal mining significantly impacted the local government and surrounding communities. The city lost revenue and faced difficulties in attracting new industries and businesses. Subsequently, the city lost employment in its mining sector and experienced an emigration of 11,622 people in 2000—particularly mining-skilled laborers, as depicted in Fig. 2. In environmental sectors, vast forests and agricultural lands were converted to abandoned, open-pit mining landscapes. In addition, numerous old buildings and mining infrastructure were left dilapidated. Mining companies and local authorities were not able to recover from these unfavorable conditions due to financial limitations and unclear property rights.

In response to the unexpected following impacts, the local government established a new vision for the city: Sawahlunto was to become a "*Kota Wisata Tambang yang Berbudaya"*—a cultural tourism mining city. The idea was to switch the local economy from coal mining to tourism by utilizing its post-mining potentials. The cultural heritage agency of the West Sumatera provincial government began its inventorization of mining heritage features in 2003. This initial step was followed by a preliminary study on the reconstruction of former mining cities for tourism, which was conducted in 2004 by Programma Uitzending Managers, an NGO from the Netherlands. Conservation and restoration efforts were officially begun in 2005

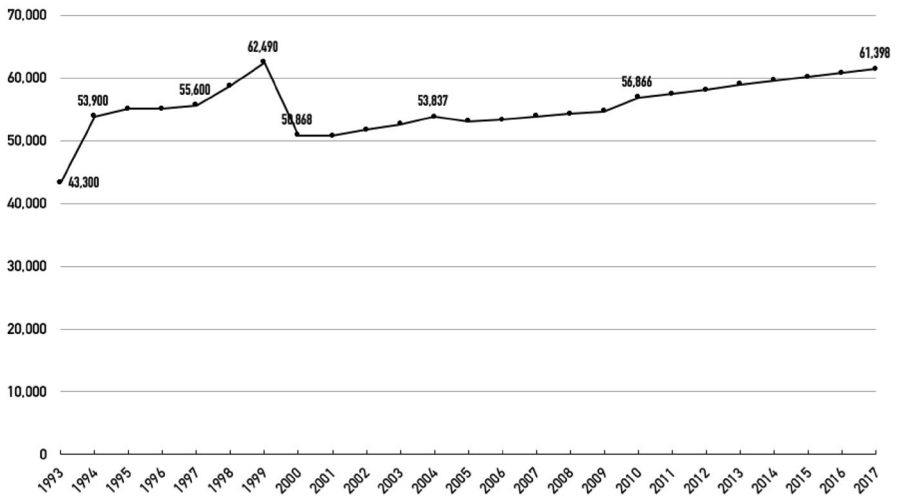


Fig. 2 Population Dynamic in Sawahlunto City 1993–2007. Source: the author, retrieved from "Statistics of Sumatera Barat Province," (2018)

through *"Revitalisasi Kota Lama Sawahlunto"* program. By 2018, the local authority recorded a significant number of mining heritage properties throughout the old town. All of these are well protected by *Peraturan Daerah Kota Sawahlunto*, the municipal regulation on the management of archeological property (law number 9, year 2016) and at the national level through *Peraturan Pemerintah*, the national law on cultural heritage (law number 11, year 2010). The distribution of primary mining heritage features is depicted in Fig. 3.

Sawahlunto Old Coal Mining Town was registered on UNESCO's WHS tentative list on January 30, 2015, in the cultural property category. The town was nominated to demonstrate the coal mining technological innovation, educational achievement, and cultural exchanges. Indonesia's central government is leading the effort, while technical assistances have been provided by ICOMOS's International Scientific Committees, its members, and independent experts. An ICOMOS technical evaluation team visited the property from September 3–7, 2018. On March 13, 2019, it published an evaluation report that approved the nomination to be submitted to the UNECO WHS committee meeting in July 2019. Some of Sawahlunto Old Coal Mining Town's prominent mining heritage features are presented in Table 4.

Sawahlunto Old Coal Mining Town is located 120 km from the capital of West Sumatera Province, Indonesia. This unideal distance from the nearest international airport is a shortcoming for the city's efforts to attract international visitors. After a 5-year transformation period, in 2005, the city recorded an annual visitor count of about 37,000 people. The following year, it rocketed up to 377,220 visitors, mainly

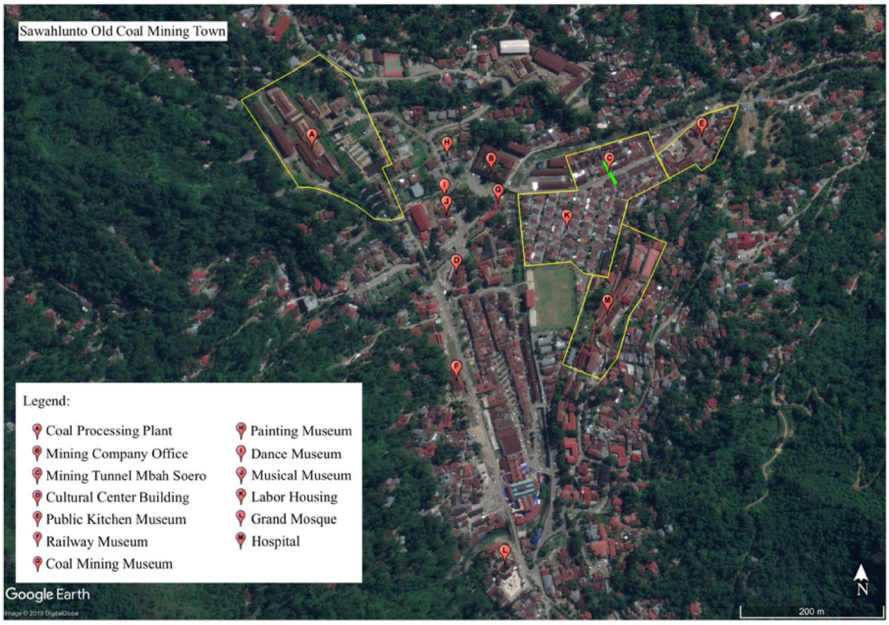
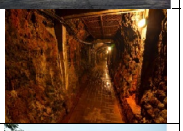
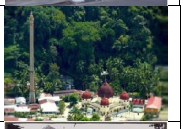


Fig. 3 Map of Sawahlunto Old Coal Mining Town. Source: Retrieved from Google Earth, modified by authors

Table 4 Attributes and value of primary mining heritage features in Sawahlunto old coal mining town

No	Attribute	Value	Image
A	Coal Processing Plant	- Established in 1900 - Former coal processing site before it is transported to Emmahaven port - The three silos represent the historical value of the ancient time mining period	
B	Mining Company Office	- Built in 1916 - Initially was used as administrative office/ Hoofdkantoor van de Steenkolenmijn by Dutch Indies - Primary city landmark with European architectural design	
C	Mining Tunnel *Mbah Soero*	- Opened in 1898, the oldest coal mining tunnel located in the middle of labor and employees housing - Reopen in 2008 as a tourist destination, 2.2 m x 2.75 m in size - Offer the experience of coal mining activities for the visitors	
D	Cultural Center Building	- Built in 1910, initially named as 'Societeit Gluck Auf' - Initially was an amusement center for high-class mining officials - Nowadays it is functioned a cultural center	
E	Public Kitchen Museum *(Museum Gudang Ransum)*	- Established in 1918 - Former public kitchen for mining employees and hospital patient - Reopen in 2005 as a museum - Exhibit cutlery and audiovisual of ancient public kitchen activities	
F	Railway Museum	- Established in 1912 - Starting point for coal transportation to Emmahaven harbor - Reopen in 2005 as a railway museum, displays train model and historical period of coal mining - Offer nostalgic ride on steam-engine locomotive for the visitors	
G	Coal Mining Museum	- Opened in 2016 - Run by the former mining company - Demonstrate the historical value of coal mining production through miniature and model	
H	Painting Museum *(Museum Lukis)*	- Opened in 2017 - Display painting collection by several well-known artists, mainly illustrate the historical ancient of coal mining in Central Sumatera	
I	Dance Museum *(Museum Tari)*	- Opened in 2017 - Represent the social value of mining heritage in Sawahlunto as a place of cultural interaction between eastern and western culture	
J	Musical Museum *(Museum Musik)*	- Opened in 2017 - Displays collections of traditional musical instrument from local inhabitant and migrant mining worker culture	
K	Labor Housing	- Built in 1900 - Intended as housing for mining workers and hospital employees. Currently occupied by mining workers descendants - Identical shape and façade with western style architectural design	
L	Grand Mosque	- Built in 1894 - Previously was a power plant, energy generator for coal mining industries and local consumption - In 1952, the building was re-modified as the biggest mosque in the city - A unique mosque tower was initially the chimney of the power plant	
M	Ombilinmijnen-Hospitaal	- Built in 1918 - The biggest health facilities in Central Sumatera region at the early mining period - The buildings are well-preserved, the function is maintained as the hospital	

due to various museum openings, post-mining tourist destinations, and a new water park, the first water attraction in West Sumatera region at that time. The number of annual visitors continues to increase steadily; in 2016, over 858,000 visitors were recorded. Mining-related tourist destinations are the biggest contributor to the increase in visitors. Former mining buildings and infrastructure that have been converted to museums, tunnels, and exhibition centers are the main attractions in the city. These competitive advantages have helped the city outperform other types of tourism in other cities within West Sumatera. Moreover, created resources offer additional value for visitors through a range of activities, including sport and adventure tourism, natural parks, water parks, and entertainment. Likewise, special events, such as an annual music festival, a mining commemoration day, the city's anniversary, a multicultural festival, and an international cycling competition (the Tour de Singkarak), invite visitors to stay in the city for a couple days.

3 Research methodology

This paper is part of a study on the determining factors of competitiveness in post-mining cities as tourist destinations. The focus is on tourists' views on the core resources and attractions of a post-mining city. Primary data are the main source of analysis in this study. Direct observations and distributed questionnaires were used to gather data from randomly selected visitors at several tourist destinations in Sawahlunto, West Sumatera Province, Indonesia. A total of 100 visitors were calculated by applying the Slovin formula at a 90% confidence level to the total number of 858,000 visitors in 2016. The researchers conducted a questionnaire survey with the assistance of local government officials and the managers of tourist destinations during May–June 2018. Once data were gathered, an exploratory approach and descriptive analysis were then utilized to assess the appeal of resources that motivated people to visit Sawahlunto as a tourist destination.

Resource variables were based on the mining-related attractions research of Jolliffe and Conlin (2011) and the destination competitiveness model of Dwyer and Kim (2003). The selected variables were chosen and adapted to accommodate Sawahlunto's identity as a post-mining city. The questionnaire survey was comprised of eleven categories: natural resources, cultural resources, tourism infrastructure, special events, the range of activities, entertainment, shopping, general infrastructure, the quality of services, accessibility, and hospitality. The questionnaire was divided into four parts: personal characteristics, number of previous visits, the motivation to visit in relation to the resources, and the possibility of returning. In particular for the "motivation to visit" section, respondents were asked to choose three reasons influencing their decision to visit. Questions about personal characteristics included the respondent's age and city of origin. In the main part, the questionnaire measured respondents' interest in the city's available, local-government-provided tourism resources using a five-point Likert scale in which 1 = very unattractive, 2 = not attractive, 3 = neutral, 4 = attractive, 5 = very attractive. The survey results are presented in the following section with mean values and standard

deviations for each variable. Resource items with mean values greater than three are considered competitive.

4 Study results

4.1 Sample characteristic

The personal characteristics of the respondents are shown in Table 5. Of the total respondents, 58% were male and 42% female. The majority were young people of up to 24 years old (61%), followed by those aged between 25 and 44 (30%), and those over 45 (9%). With respect to education, the majority of the sample had a university degree or higher (51%) and high school (47%). Regarding their origins, 56% of respondents were from West Sumatera Province, and another 44% came from outside the region. Tourists from the region's surroundings were same-day travelers, while visitors from outside the region traveled to the capital by airline and continued their trip to Sawahlunto Old Coal Mining Town using busses or automobiles. In another comparison, 92% of the respondents were domestic tourists, while the rest were international visitors. This study also showed that more than a half of the respondents (52%) were visiting for the first time, and 19% had traveled there more than five times.

In combining the characteristics of the sample, this study highlights some important features. First, more than a third (39%) of young visitors were first-time

Table 5 Respondent characteristics ($N = 100$)

	Percentage (%)
Gender	
Male	58
Female	42
Age	
24 years or less	61
25–44	30
45 or more	9
Education	
Primary school	2
High school	47
University degree or higher	51
Origin	
Within region	44
Outside region	56
Number of previous visits	
None	52
1	13
2-5	16
More than 5	19

Table 6 Motivation of visits ($N = 100$, each sample choose three reasons)

Motivation	Percentage (%)
To relax	13.33
Enjoying natural beauty	23.33
Visiting cultural features/sites	25.33
Entertainment	11.00
Enjoying food	2.67
To seek new experience	9.33
Visiting friends/relatives	3.67
To engage in sports and recreation	1.00
Shopping	1.00
Pilgrimage	0.67
Business visit	0.67
Others	8.00

travelers to a post-mining city. This reflects the enthusiasm of the younger generation in seeking the cultural values and mining history. Likewise, in respect to their origin, almost a quarter (24%) of first-time visitors were from outside the region. This revealed that mining heritage tourism continues to attract tourists to the city. Lastly, 30% and 29% of the sample, respectively, were young visitors from outside the region and the international market. An examination of tourists' motivations to visit revealed that visiting mining heritage features (25.33%) and enjoying natural beauty (23.33%) were the primary reasons for the visit. This is not surprising since the city is strongly competitive when it comes to these attributes. See Table 6 for a detailed list of motivation on the visit.

4.2 The attractiveness of tourism resources

The attractiveness of resources is ranked in Fig. 4. All mean scores are above three, which means all resource items were acknowledged to be attractive by the

Resources	Attractiveness			Resources	Attractiveness		
	Rank	Mean	SD		Rank	Mean	SD
Mountain	1	4.59	0.51	Special Events	12	4.14	0.77
Scenery	2	4.49	0.63	Language	13	4.12	0.73
Heritage Site/Museum	3	4.43	0.67	Accessibility	14	4.11	0.83
Architectural Features	4	4.42	0.68	Handicraft	15	4.10	0.82
Hospitality	5	4.40	0.68	Entertainment	16	4.07	0.92
Customs	6	4.32	0.71	Flora and Fauna	17	4.02	0.83
Mine Pit Lakes	7	4.31	0.68	Shopping	18	3.98	0.79
Post-mining Landscape	8	4.28	0.74	General Infrastructure	19	3.91	0.88
Range of Activities	9	4.28	0.77	Traditional Art	20	3.89	0.99
Cuisine	10	4.19	0.77	Climate	21	3.87	1.09
Quality of Services	11	4.18	0.73	Tourism Infrastructure	22	3.77	0.99

Fig. 4 Resources ranked by its attractiveness mean scores ($N = 100$)

respondents. According to the respondents, the top rank attractors comprise of natural beauty and post-mining potential resources. The old Sawahlunto coal mining city consists of four districts, namely Lembah Segar, Silungkang, Barangin and Talawi, respectively. The Lembah Segar district is the city center where most mining heritage sites, museums, and western styled architectural features are located. This district also features unspoiled nature and beautiful scenery from surrounding mountains. Moreover, it hosts a cultural mix between the native inhabitants and the immigrant workers. Their unique social structures, along with a mining tradition, offer an exceptional experience to the visitors. Possessing complete natural and cultural resources has been an advantage for the Sawahlunto coal mining city. Currently, the city is on the tentative list of UNESCO WHS list. The inscription on the WHS list is expected to improve the attractiveness of the resources in tourism.

Mine pit lakes and post-mining landscapes occupy the seventh and eighth spot. These are located outside the city center, mainly in the Barangin and Talawi districts. It has been utilized for a range of various activities such as sport and adventure tourism, natural parks, and environmental tourism. The city is also well known for weaving traditional clothes, called *Songket,* which are concentrated in the Silungkang region. It has been developed for many years as an economic alternative in the post-mining period and could be an alternative attraction for inviting the visitors.

Interestingly, special events, entertainment, and shopping ranked in the bottom half. Various events, entertainment attractions, and available shopping centers throughout the city were deemed inferior when compared to natural and mining heritage resources. The events and entertainment attractions are held occasionally, and not all the visitors could experience them during their traveling time. Sawahlunto also lacks a pleasant general infrastructure, particularly the road network and local transport system. The city does not have an interconnected mode of public transportation which hampers the mobility of visitors. Another striking feature is the mean score of tourism infrastructure which settles the last position. The unavailability of five- and four-star hotels has significantly decreased the attractiveness of the city from the perspective of the respondents. The most convenient accommodation facilities are two- and three-star hotels with only 61 rooms in total. Other accommodation types are 165-room homestays spreading around the city, managed by the local community (Statistics of Sawahlunto City 2017). A limited number of tour operators and travel agents also consequently reduce the accessibility of the city from outer regions. However, all of these shortcomings do not hinder the possibility of returning visits. All of the respondents acknowledged the attractiveness of post-mining city as a tourist destination by confirming the possibility of a return visit.

5 Conclusions

Transforming post-mining city into a tourist destination is not a utopian project. New Brunswick in Canada and Wallonia in Belgium have proved that mining heritage tourism could be a basis for development in post-mining period. Though a post-mining city is often perceived as decay and black environmental image, it poses natural and cultural potentials for tourism. However, before getting into the tourism

market, there are a lot of things to do with post-mining legacies. First, remediation in post-mining lands and preservation of mining heritage assets are an obligation. These tasks are often problematic in post-mining period because of unclear property rights, limited funding, and vague responsibility among mining company, local authority, and the local community. Then there is a need to encourage all mining community in strategic tourism development. Either former mining workers or youth generation has a similar role in maintaining mining identity through generation. Lastly, created and supporting resources must be developed along with a smart destination marketing strategy.

This research analyzes the attractiveness of tourism resources from the demand perspective, using an empirical research approach focused on the visitors at Sawahlunto Old Coal Mining Town. Measuring the perspectives of these visitors is beneficial for cities to understand the main motivations and interests of their visitors. Research findings show that the primary motive of the visitors is to visit cultural feature and mining heritage, such as museums, mining tunnels, and other historical sites. It is supported by the higher mean score of the attractiveness of natural and cultural attributes measured in the study. These mining-related resources are the main strength of the city; therefore, it has to be listed as the top priority. The uniqueness of old buildings may be found in some other tourist destinations, but the historical worth along with social value of mining heritage is exceptional and connects visitors to the past.

The study also indicates that mining heritage tourism is continually recognized by the visitors. It is not only appealing to elderly people, who in many cases may remember the glory of the mining era, but it also invites many young visitors who never experienced living in that era. It suggests that the cultural values of a mining heritage are attractive across generations. Another highlighted finding is that visitors to cultural-based tourism sites are well-educated people who aware on the cultural value of the destination. To summarize, recognizing visitor preferences and motivations can significantly contribute to the decision-making process and policies related to tourism development.

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References

Bridge G (2004) CONTESTED TERRAIN: mining and the environment. Annu Rev Environ Resour 29(1):205–259

Broxterman D, Letdin M, Coulson E, Zabel J (2019) Endogenous amenities and cities. J Regional Sci 59:365–368

Carlino GA, Saiz A (2019) Beautiful city: leisure amenities and urban growth. J Regional Sci 59(3):369–408

Crouch GI, Ritchie JRB (1999) Tourism, competitiveness, and societal prosperity. J Bus Res 44(3):137–152

Cuong NDH, Chesworth N, Jollife L (2011) Tourism options for an open pit coal mine at Ha Long Bay, Vietnam. In: Conlin MV, Jolliffe L (eds) Mining heritage and tourism. A global synthesis. Routledge, Abingdon, pp 183–193

Dale B (2007) An institutionalist approach to local restructuring. Euro Urban Regional Stud 9(1):5–20
Dolzblasz S (2012) Local development actors in a post-mining municipality. In: Wirth P, Cernic-Mali B, Fischer W (eds) Post-mining regions in central europe. problems, potentials, possibilities. OEKOM, Munchen, pp 92–103
Dwyer L, Kim C (2003) Destination competitiveness: determinants and indicators. Curr Issues Tourism 6:369–414
Edwards JA, iCoit JCL (1996) Mines and Quarries Industrial Heritage Tourism. Ann Tourism Res 23(2):341–363
Ellis R (2002). Mining annual review 2001, London, UK
Falser M, Yang M (2001) Industrial heritage analysis. http://whc.unesco.org/archive/ind-study01.pdf. Accessed 29 May 2019
Ferilli G, Sacco PL, Noda K (2015) Culture driven policies and revaluation of local cultural assets: a tale of two cities, Otaru and Yübari. City Cult Soc 6(4):135–143
Franco SF, Macdonald JL (2018) The effects of cultural heritage on residential property values: evidence from Lisbon, Portugal. Reg Sci Urban Econ 70(2016):35–56
Frey BS, Pamini P, Steiner L (2013) Explaining the world heritage list: an empirical study. Int Rev Econ 60(1):1–19
Harfst J (2014) Constant crisis? Innovative approaches in old industrialised regions in Central Europe. In: Mira RG, Adina D (eds) Urban sustainability innovative spaces, vulnerabilities and opportunities. International Association People-Environment Studies, Coruna, pp 227–240
Harfst J (2015) Utilizing the past: valorizing post-mining potential in Central Europe. Extr Industries Soc 2(2):217–224
Hassan SS (2000) Determinants of market competitiveness in an environmentally sustainable tourism industry. J Travel Res 38(3):239–245
Hattori K, Kaido K, Matsuyuki M (2017) The development of urban shrinkage discourse and policy response in Japan. Cities 69:124–132
Horvath G, Csullog G (2012) The role of ecotourism and geoheritage in the spatial development of former mining regions. In: Wirth P, Cernic-Mali B, Fischer W (eds) Post-mining regions in Central Europe. problems, potentials, possibilities. OEKOM, Munchen, pp 226–240
Jolliffe L, Conlin MV (2011) Lessons in transforming mines into tourism attractions. In: Jolliffe L, Conlin MV (eds) Mining heritage and tourism. A global synthesis. Routledge, New York, pp 241–247
Lanzara G, Minerva GA (2019) Tourism, amenities, and welfare in an urban setting. J Reg Sci 59:452–479
Lenartowicz JK, Ostrega A (2012) Revitalisation of post-industrial areas through the preservation of technical heritage in Poland. AGH J Min Geoeng 36(2):181–192
Lintz G, Wirth P, Harfst J (2012) Regional structural change and resilience. Raumforsch Raumordn 70(4):363–375
Marot N, Cernic-Mali B (2012) Youth and regional development—participation by future stakeholders in today's decisions on post-mining regions. In: Wirth P, Cernic-Mali B, Fischer W (eds) Post-mining regions in Central Europe. problems, potentials, possibilities, OEKOM, Munchen, pp 195–212
Martinez-Fernandez C, Wu CT, Schatz LK, Taira N, Vargas-Hernández JG (2012) The shrinking mining city: Urban dynamics and contested territory. Int J Urban Reg Res 36(2):245–260
Mendes I (2013) Mining rehabilitation planning, mining heritage tourism, benefits and contingent valuation. http://www.repository.utl.pt/handle/10400.5/5691. Accessed 15 July 2019
Müller B, Finka M, Lintz G (2005) The challenge of structural change for industrial cities and regions in the cee countries. In: Müller B, Finka M, Lintz G (eds) Rise and decline of industry in central and Eastern Europe. A comparative study of cities and regions in eleven countries. Central and Eastern European Development Studies. Springer, Berlin, pp 1–24
Novais MA, Ruhanen L, Arcodia C (2018) Destination competitiveness: a phenomenographic study. Tourism Manag 64:324–334
Orange H (2008) Industrial archaeology: its place within the academic discipline, the public realm and the heritage industry. Ind Archaeol Rev 30(2):83–95
Otchere FA, Veiga MM, Hinton JJ, Farias RA, Hamaguchi R (2004) Transforming open mining pits into fish farms: moving towards sustainability. Nat Resour Forum 28(3):216–223
Pizzera J, Osebik D (2012) Strategic destination management in an alpine mining region—adventure sports tourism as chance for image transformation. In: Wirth P, Cernic-Mali B, Fischer W (eds), Post-mining regions in Central Europe. Problems, potentials, possibilities, OEKOM, Munchen, pp 212–225

Poria Y, Butler R, Airey D (2004) Links between tourists, heritage, and reasons for visiting heritage sites. J Travel Res 43(1):19–28
Ritchie JRB, Crouch GI (2003) The competitive destination. A sustainable tourism perspective. CABI, Wallingford
Rodwell D (2012) The unesco world heritage convention, 1972–2012: reflections and directions. Historic Environ 3(1):64–85
Różycki P, Dryglas D (2017) Mining tourism, sacral and other forms of tourism practiced in antique mines—analysis of the results. Acta Montanistica Slovaca 22(1):58–66
Statistics of Sawahlunto City (2017) Sawahlunto in figures
Statistics of Sumatera Barat Province (2018) Retrieved June 25, 2018, from https://sumbar.bps.go.id
Su YW, Lin HL (2014) Analysis of international tourist arrivals worldwide: the role of world heritage sites. Tourism Manag 40:46–58
Tan F, Jiao YY, Wang H, Liu Y, Tian HN, Cheng Y (2019) Reclamation and reuse of abandoned quarry: a case study of ice world & water park in Changsha. Tunn Undergr Space Technol 85:259–267 **(October 2018)**
Throsby D (2009) Tourism, heritage and cultural sustainability: three "golden rules". In: Girard LF, Nijkamp P (eds) Cultural tourism and sustainable local development. Routledge, New York, pp 13–29
Uysal M, Chen JS, Williams DR (2000) Increasing state market share through a regional positioning. Tourism Manag 21(1):89–96
Veiga MM, Scoble M, McAllister ML (2001) Mining with communities. Nat Resour Forum 25(3):191–202
Vengesayi, S. (2003). A conceptual model of tourism destination competitiveness and attractiveness. In: ANZMAC 2003 conference proceedings, (December), 637–647
Wirth P, Cernic-Mali B, Fischer W (2012) Problems and potentials of post-mining regions. In: Wirth P, Cernic-Mali B, Fischer W (eds), Post-mining regions in Central Europe. Problems, potentials, possibilities. OEKOM, Munchen, pp 14–30
Wirth P, Chang J, Syrbe R-U, Wende W, Hu T (2018) Green infrastructure: a planning concept for the urban transformation of former coal-mining cities. Int J Coal Sci Technol 5(1):78–91
World Bank Group. (2018). Managing coal mine closure: achieving a just transition for all
World Bank and International Finance Corporation (2002) Global mining. It's not over when it's over : mine closure around the world