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Mining Industrial Landscape, Heritage Value and Tourism Opportunity: Focus on Lampang's Mae Moh Mine and Communities in its Neighborhood

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Abstract

This study investigates potential of reuse of the mining heritage in Mae Moh Mine, Lampang Province for tourism and recreation purpose. The study surveyed built and cultural heritage of mining, assessed its values, and utilized in-depth interview and focus group discussions with key informant groups. Mining heritage could be viewed as new to Thailand and seems contradictory in the feeling when proposing it with tourism. Nevertheless, international example practices of reuses and transformation of former mines and factories could settle some initial ideas for Thailand, in particular for the case of Lampang Mae Moh Mine. The study pointed out significance of alternative approach for the tourism industry of Lampang, while conservation of the industrial heritage should also be taken into account due to the fact that this type of heritage is at risk of disappearing. Finally, this study suggested potential approach for future consideration.

Keywords: Industrial Heritage, Lampang, Mae Moh Mine, Mining Heritage, Tourism

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Introduction

Mining is considered one of the main components in the field of the industrial heritage. Former and working mines have potential to be sustainably developed as tourist attraction and recreational park because of their prominent significance in geological and historical value, and industrial technological advancement. Different layers of mines seen as huge mining landscapes show different stages of working, which in turn, reveal the fact of how much humanity has needed, consumed and relied on natural resource. Mining landscape is thus considered an interaction between humanity and earth, workers and grandness of machines. Tourism and recreation depend so much today with creativity and innovation. It is challenging to develop a mine as a tourist offer by utilizing its grandness of working objects, machines and landscapes; transforming it into 'physical objects of attention' (Amano, 2016). It becomes significant as a resource for creating and developing new branches of industrial heritage related tourism. Mining, especially coal mining activities as part of power plant, has been perceived as dangerous or environmentally hazardous industry. In this case, tourism, if applied, can take part in helping residents who live nearby feel safer about the industrial activities by disseminating knowledge on power production and present friendly and risk-free character of its activities (Boros, Martin, and Pal, 2013), apart from responsible practice of the mine itself. There is a growing appreciation of the physical beauty of mining landscapes, alongside recognition of 'their historical and cultural significance' (Cole, 2004, in Frew, 2011, p. 73). In the case of Kojo Moe (Factory Infatuation), Japanese tourists appreciated its industrial facilities not because of their past but more because of their aesthetic value; according to Japanese industrial tourists, the plants and factories are beautiful (Boros, Martin, and Pal, 2013). Improvement of built landscape is very important in shaping or influencing visitors' view and interest. With the idea to create fascination with factories and imagination that sites of industrial facilities are 'simulacra of futuristic urban technoscape', the industrial factories become the subject of appreciation among visitors (Amano, 2016). What it brought about is fundamental changes in people's cognition about the physical presence of factories in social space.

A notable point regarding transformation of old mine sites for recreational purpose concerns the most common and fundamental problem of mining industry; that are the extensiveness of a given area, especially in the case of open-cast mining, and other environmental risks. Thus, turning old mine sites for new use, such as recreational use, has a goal of restoring the environmental and aesthetic functions, which potentially contributes to restore the economy of the areas surrounding the mine (Jelen, 2018). Another point is that mining can be recognized as the heritage due to its historical, cultural and technological values developed or achieved for and cultivated from human activities of discovering, extracting, mining and using natural resources (in this case, coal), which have left human's cultural traces, knowledge and wisdom of the past behind. These can be learned from many remnants left from mining activities. Given this, restoration of old mining sites takes into account preservation of remnants of previous mining, both material artefacts and buildings and the non-material components. Jelen (ibid) proposed a representation approach of recreating former mining site into an attraction in the realm of cultural tourism, not just presenting through museum form as frequently seen, but rather grasping the individuality and specific 'genius loci' or

authentic identities of the mining heritage sites and reusing mine landscape and machinery formerly used, for heritage interpretation, as well as using real former miners to tell mining stories or recounting their own experiences to visitors.

The study of the mining heritage in the case of the Jáchymovsko area, Ore Mountains in the Bohemian region of Czech Republic discusses different approaches of mining heritage identification and interpretation, which highlights the content of the complex of mining heritage and the significance of its individual features (Jelen & Kučera, 2017). The study addresses an importance of processes, values and stakeholders involvement to be provided to aid in recognition, management and interpretation of the mining heritage. Its mining heritage representation was started by an establishment of the Royal Mint Museum, and later the expansion has been gradually emerged through a linkage with miners' associations, music groups, miners' descendants, and other local citizens and municipality. New museums and nature trails were later built in the area. The study deliberates that local mining heritage can be diversely interpreted in ways that promote the contemporary living of people in the neighborhood, and not only immovable objects such as buildings and anthropogenic interventions in the landscape such as ponds, waterways, spoil heaps, but also local celebrations and traditions can form parts of this. Potential of mining heritage tourism can be proved by an increasing attention and establishment of international associations and networks to promote values of the industrial heritage, which includes the mining industry's glory and fall from the past centuries. According to the UNESCO World Heritage Site, there are 31 old mining sites around the world inscribed as the World Heritage Properties, and another 142 on the Tentative List. This has convinced how much significant of old mine sites as the heritage that should be preserved; in which tourism can be a potential tool.

Mae Moh Mine in Mae Moh District, Lampang Province is the largest Lignite Coal Mine of Thailand. In 1917 (B.E. 2460) during King Rama 6th, Phra Chao Boromwongse Kromma PhraKamphaengphet Akarayothin, at that time was appointed as the Director-General of the Royal State Railway of Siam (RSR). He commanded that the forestry land of the Siam must be preserved and therefore it was necessary to seek other sources of power to replace wood for fuelling the Siam's steam locomotives. By his command, Mr. MG. Boyer a French expert during that time was hired to serve in the survey of the Siam's natural sources of energy during the beginning phase. During 1921- 1923 (B.E. 2464- 2466), Mr. Wallace Lee, an American surveyor expert was hired for this operation. The survey reported there was a lignite coal source in Mae Moh, Lampang Province and in Klong Kanan, Krabi Province. Mae Moh Mine is the largest lignite mine in the country. It has been in operation since the reign of King Rama VII, when the king sent a memo dated February 16, 1927 to Chao Phraya Pholthep to reserve the mine for state operation instead of private concession. Mae Moh Mine showcases outstanding character in terms of geological and industrial development through time, therefore possessing high significance of both natural and built landscape. A question towards this was how this landscape could be adaptively and sustainably reused to leverage its value while also preserving this type of heritage in a more inclusive approach.

This study aimed to investigate potential of Mae Moh Mine in Lampang, its landscape, and former mining-related machinery as the industrial heritage, for future transformation into tourist place. There are outstanding international cases of transforming former mine lands and machinery into tourism and recreational sites offering alternative tourist activities and experiences, while integrating cultural activities of communities nearby. The study surveyed components of mining heritage of Mae Moh Mine, identified key values, features or qualities of the mining culture as the industrial heritage, and suggested alternative approach of tourism based on this heritage by reviewing some international practices. Limitations for further development were also addressed.

Objectives

1. To survey components of mining heritage of Mae Moh Mine.
2. To identify key values, features or qualities of the mining as the industrial heritage.
3. To find out alternative approach of tourism based on the mining heritage.

Expected Benefits

1. Inventory of main components of the mining industrial heritage of Mae Moh Mine
2. Opportunity for alternative tourism approach based on mining heritage

Research Methodology

This research utilized the qualitative method in collecting the data. Documentary research was first conducted. Then, fieldworks for physical recording and documenting, and assessment of significance and value were carried out. Fieldworks for physical recording, documenting and assessing the significance applied the process of industrial heritage analysis based on the Nizhny Tagil Charter (The Nizhny Tagil Charter for the Industrial Heritage, 2003) and the Burra Charter (The Burra Charter, 2013) which was also applicably used by Pearson and McGowan in assessing the heritage value of the industrial heritage in the case of former mining sites (Ahmad & Jones, 2013). The in-depth interviews were carried out with 3 divisions of Mae Moh Mine and Electricity Generating Plant, under Electricity Generating Authority of Thailand (EGAT), including Civil and Mine Reclamation Division, Community Affairs Division and Sports, Leisure and Recreation Group. Two key informants from the Civil and Mine Reclamation Division are in charge of mine rehabilitation works. The Community Affairs Division includes 2 key informants who work on the part of community communication and corporate social responsibility planning, and another 2 key informants are from the Sports, Leisure and Recreation Group. The interviews were conducted to gather the content of the mining heritage and their points of view towards development potential by adaptive reuse of the mining heritage, including limitations that may be felt. Furthermore, the focus group discussions were conducted with local communities, in which 11 representatives were from Moh Luang Community, and 20 representatives were from Baan Mai Na Kham Community, to acquire their perception and recollection on the industrial and

mining heritage and opinions on cultural and tourism development that help connect the mine and the communities.

Results

Components of the Mining Heritage and Physical Description of Mae Moh Mine

Mae Moh Mine is the open pit mine with a total mining area of 9,260 acres and external dumping area of 10,240 acres. The mine can be separated into the main functional areas as in Figure 1, including mining zone, slag heap zone, energy generator or power station zone, reservoirs, office and machine maintenance zone, residential zone, and tourism and recreational zone. The power station zone is connected with a reservoir. The older part of the mine includes the old mine pit no longer operated and the 1st, 2nd and 3rd energy generators. This vast site situates in the natural setting that connects with tributaries, forest plantations, and villages located in Mae Moh Basin with the backdrop of limestone mountain. The massive zone with industrial buildings, facilities and machines represent the industrial landscape of this site. The location of Mae Moh Mine is connected to Mae Moh Railway Station, which is also considered a highly significant industrial heritage these days. Driving through the entrance of the mine sees the long old conveyor belt which once transported the coal from the mine to the power station zone. In the functioning zone, there are 13 power plant units; no. 1- 13. Unit no. 1-3 were decommissioned in 2003 due to decline in production capacity, while unit no. 4-13 still are under the operation with different levels of production capacity. The reservoirs around the mine include Mae Kham Reservoir, Houy Ped Reservoir, and Houy King Reservoir. There also are other zones outside the mine such as Mae Moh EGAT College of Technology and Management and some other offices that serve technical and educational supports.

The tourism and recreational zone includes the botanical garden and the slider playground area, the recreation and club house and golf course, the Mexican sunflower field with scenic point, and the museum and the outdoor machine display area. The botanical garden at the northeast of the mine is a reclaimed area, transformed from dumping area to be a public park decorated with beautiful plants and unused truck wheels, from which visitors can see the mine landscape and the working machine from the scenic tower. There is the monument of King Rama 7th built to commemorate His Majesty's command to reserve this land for coal mining. This area also is the spot where the famous and fun slider playground is located. This park was formed by landfilling with soil and coal waste from coal mining activity, and then was covered with grass to create a new recreation area. The Mexican sunflower field at the north of the mine is the high hill from which the mine landscape and the reservoir adjacent to the mine can be viewed. At the top of the hill, there is the horticulture exposition for His Majesty the King. Seen from the museum building there is a shelter- belt of pine trees planted along the edge of the mine to filter dirt from the open pit mining operation.

The museum is the highlight of the tourism and recreational zone, giving knowledge about the geology of mine environment, the history of the mine, and electricity production technology with 3D

technology. The museum starts with the first section with a two-minute video introducing “Little Lignite”, an animation character as a mascot representing Mae Moh mining works. The next room is the history of the king and the establishment of the mine, where visitors are presented a five-minute video about the king and Thai constitutions. A part of the wall is made from glass for visitors to view the distant mine with mountainous background. There is also the king’s hand-written memo sent to Chao Phraya Pholthep about reserving the mine for state use. The next section is entirely concerned with geology using a 12-minute 3D movie about the birth of the planet earth, all the successive ages and evolution of living organism. Then, visitors are taken to the next room that exhibits the ecology and animal and plant fossils in those ages. The next room displays stone layers, geological structures and lignite from the mine with specimens of the substance of different qualities. On the other side of this room is a small section that displays the Mae Moh Mine and Electricity Plant, with a short video demonstrating how lignite is processed. The last room is the 3D theater explaining how this mine is significant and the brief operation of mining. A wooden bridge at the back leads visitors to a scenic point where they can view below an excavator, a conveying belt and huge machines displayed on a green lawn, with the actual mine located in the mountains some distance away. The residential zone functions to welcome overnight visitors, providing bungalow and hotel rooms, and 18-holes golf course.

Key Values, Features or Qualities of the Mining as the Industrial Heritage

Historical value: History of Mae Moh Mine is associated with the Siam’s royal command for the use of the mine land for national development during the time the country was in high demand of national social and economic development. As Mae Moh Mine with its large landscape that occupies many older villages settled before its establishment long time ago, and natural settings, the mine’s significance is therefore a contradiction and it is significantly a driver to changes of actions in environmental and social dimensions. In the transition where Thailand has been exploring alternative sources of energy for national electricity and water supply consumption, Mae Moh Mine has thereafter been in both a “black and white remark”; the source of environmental unfriendliness and the source of needed energy. Historically, regardless of the image and discourse of environmental problem that derived, Mae Moh Mine shares the history of Lampang during its transition of town change. The historical value of Mae Moh Mine is embedded in the geological character of Lampang

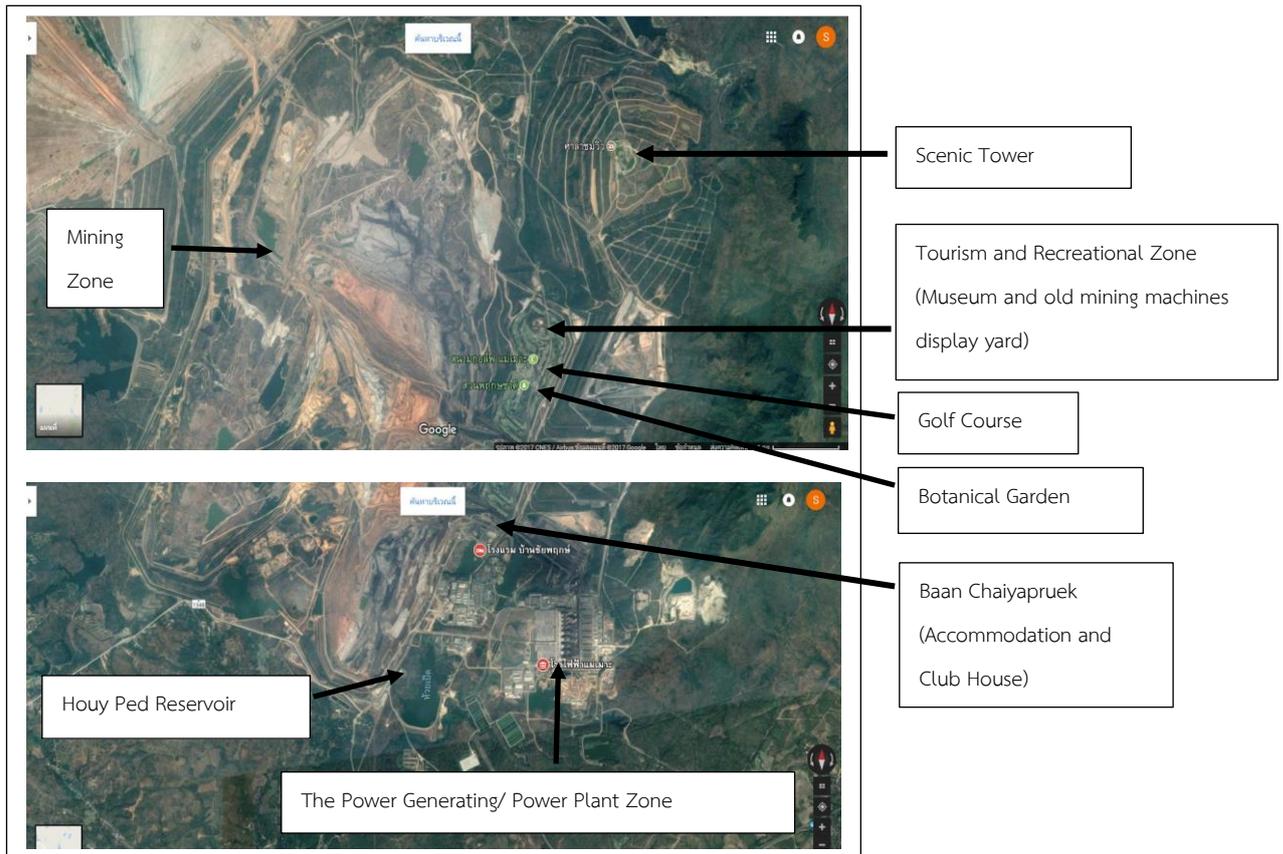


Figure 1: Landscape and zones of Mae Moh Mine
From Google Earth

Social value: Mae Moh Mine has been with Lampang for decades. It has passed many social events, confronting local people living in proximity. To serve the nation's needs of natural resources for mass consumption of electricity supply, we could not ignore the past story of people who had lived in the mining area being asked for move out, as well as high environmental cost in order to benefit nationwide. There was a story of local people who had to move out as the areas were found to be a source of lignite coals for national development. These people sacrificed the lands for the nation. This reflects social value of the mine and its people, who in this generation see the mine as their heritage; the value concerns its mark in the memories of local people in its existence as the source of mining operation with an inconvenient truth to accept. Mae Moh Mine has been on track of finding solutions to the environmental problems which inevitably occur from the production, as well as helping the communities around the mine through its corporate social responsibility (CSR) activities and offering various jobs for the locals to work in the mine, making the people's living quality very much better. There are more infrastructure developments and community product development programs including some extents of tourism and homestay program, as well as the landscape improvement of the district.

Industrial value: The industrial value of Mae Moh Mine is represented by its industrial character, which the researcher would like to describe by the aspects of machines and trucks and structural integrity. Huge-size trucks and machines amaze us by their size. According to the data acquired from the researcher's survey, most old machines had been used for more than 20 years and were manufactured in Germany, United States of America, Japan and Australia. They are still in good condition despite their lengths of age and use time. This marks the quality of materials used in industrial manufacture in the past, with an emphasis on the long age of the mining operation of Thailand. The structural integrity of the industrial value can be divided into visual integrity and functional integrity. In terms of visual integrity, the vast area of the mine puts on view the spectacle of the vast landscape of the mining site that connects with forests, streams and reservoir. The view of the mine landscape is enhanced with the tall, protruding 10 power plants decorating the landscape. The functional integrity of the mine landscape can be perceived from the physical continuity of both the geological character, mountains and the mine itself. The landscape shows the rurality of the site that incorporates a mix of agricultural and industry. Economically, the site reflects how the geological resources that had been developed during a long course of time have influenced local character and cultural context: the way people earn their living and the provincial industries, to the national scale represented by the extensive use of coal for producing electricity for people nationwide. Within the site, it shows the functional integrity especially when we emphasize the fact that it still operates as the national electric power plant. The site has been used heavily for producing the electricity supply to the nation. Being the non-renewable resource, the site is also prone to a shortage of lignite within approximately 50 years.

Geological value: Mae Moh mining landscape can be viewed as the evolved landscape, which has evolved as a result of economic activity, and has direct association with natural environment. In this case, it is about the geology of the coal land. Evolved landscape is divided into 2 types: relic (or fossil) landscape and continuing landscape (Douet, 2012, p. 49-50). Mae Moh mining landscape represents both types. It has the significance in terms of the source of natural coal by the formation of fossiliferous beds and the coalification process. It has been resting under the earth for long course of time until humans have discovered it. Mae Moh represents the most extensive landscape of coal deposits with the Paleogene - Neogene sediments being preserved. The basin is dominated by massive mudstone, sandy clay, shale and coal beds laid down during the Paleogene period 66.5 to 1.6 million years ago. The Mae Moh Basin contains the largest coal deposit in Thailand extended to the 16.5 kilometers in length and 9 kilometers in weight. A geological study reported that the stratigraphy was divided into three formations: (1) the Huai King Formation, with the conglomerate of sand, silty sand, and clay with a thin layer of coal, lignite, up to 320 meters thick; (2) the Na Khaem Formation alternations between a series of massive claystone and lignite layers indicating lake and swamp environments alternately, 420 meters thick; and (3) the Huai Luang Formation, which appears to be a red bed formation comprising claystone, silty claystone indicating fluvial environments, up to 400 meters thick (Sepulchre, 2010; Wickanet, 2005). The mine area also is the land which formed the thickest bed in the world of ancestral fresh water molluscan fossil (Department of Mineral

Resources). The south of Mae Moh Basin is dominated by rolling hill terrain and some short mountains of Pleistocene basaltic flows with some distinctive forms of ancient volcanic craters. The two examples are Doi Pha Khok Champa Daed and Doi Pha Khok Hin Fu, resting from one another between 2 kilometers.

Aesthetic value: Picturesquely, Mae Moh Mine through human gazes can also be defined as a continuing landscape. The mine visualizes the panoramic scenes that are so continuing. The ideology explaining strong, undeniable and reciprocal relationships between humanity and nature emphasizes, as Thomas, Sim and Poulton (2001) (in Satherley, 2005) stated, that the boundaries between natural and cultural landscape are so blurred. These boundaries are so blurred that separation of these two landscapes is nigh impossible and that of the so-called 'natural' landscape that remains, many have become dependent on humans for their survival. Reading the phrase 'for their survival', this conveys to us a significant message that 'it is the survival of both the given natural landscapes and humans'. 'Heritage' is human construct- associated as it is with human memories and narratives. Thereafter we could feel right to say that the cultural landscape heritage exists to serve human ways to feeling and narrating 'aesthetics' of the past, as well as when individual at that moment, is gazing at and spiritually is being deep into the landscape (or the 'land').

Alternative Approach of Tourism based on the Mining Heritage

The in-depth interviews aimed to inquire into perspective of 6 key informants of Mae Moh Mine from Civil and Mine Reclamation Division, Community Affairs and Sports Division, and Leisure and Recreation group (Bike Club). The interviews cover aspects of current uses and plan for future uses of the mining landscape and assets, and opinions regarding tourism development based on the industrial heritage content. The main objective of mine landscape management is to return the used mine site and the waste such as fly ash and bottom ash from mining and electricity production, to more productivity during its approximately 50 year life span. Reclamation process typically begins while the active mining is still occurring. Therefore, mining and restoration through reclamation have been done continuously and progressively throughout the life of the mine (until the closure which is B.E. 2594 or 2051). Moreover, there is a plan for reclaiming the landscape with a landscape plan and design incorporating future uses with recreation and tourism. The fly ash and bottom ash dump sites will be reclaimed into park (eco-park). The structure at the power generating zone might be developed into alternative energy park and museum. Concerns are on high cost for adaptive reuse of the mine site and safety issue. All these activities require environmental impact assessment. Currently Mae Moh Mine (EGAT Mae Moh) has the Reclamation Master Plan. According to the Minerals Act B.E. 2060 (A.D. 2017) (developed from Minerals Act B.E. 2510) (Department of Primary Industries and Mines), one of the duties of a holder of a mineral exploration license shall comply as the following: "(8) to rehabilitate the mined area, during the mining and subsequent to the closure of the mine, in accordance with the plans on the rehabilitation, development, exploitation and surveillance of impacts on the environmental quality and public health as approved by the Minerals Committee".

To comply with the related law and regulation, the Reclamation Master Plan was formulated. The part that directly relates to this research is the End- Use Plan. There is a variety of possible end uses for mine sites. For Mae Moh Mine, 3 categories of uses have been planned and implemented to the mine site: (1) reforestation; (2) water storage (3) recreation. Specifically to the end-use plan for recreational purpose, 4 zones were mapped for this use with details as follows, with Figure 2 that exhibits the mine site and the 4 areas in the reclamation plan for future end use: (1) the area near the mine site on the northeast (N.E Dump) has been rehabilitated with park and forest concept (Suan Chalem Phrakiet or Sunflower Park), and the area is near Mae Kham Reservoir (number 1 in Figure 2); (2) the mine waste dump area outside the mine site on the east, where today it is designed for natural playground slide, golf course and Botanical Park. The current museum is also located here (number 2 in Figure 2). The last two waste dump zones include the zone on the southwest and on the northwest: (1) the zone on the southwest (S.W Dump) is being used as another dump area from mining activity (number 3 in Figure 2); and (2) for the zone on the northwest (N.W Dump), there is no reclamation activity in terms of recreation yet (number 4 in Figure 2). However, both zones are in the reclamation plan established for future end use, which is landscaping with scenic point and parking area.

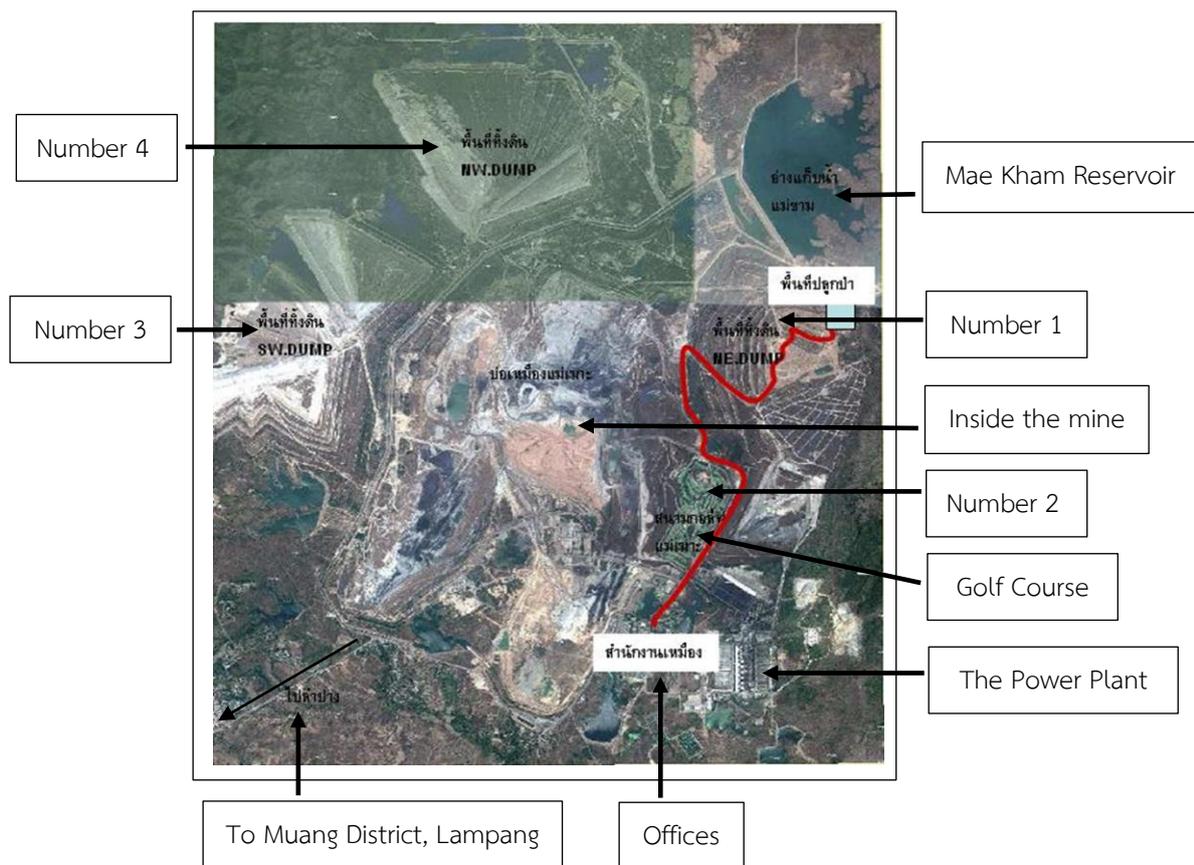


Figure 2: The mine site and the four areas in the reclamation plan for future end use

Mae Moh Mine has its initial conceptual scope for the mine to be a learning site and a tourist attraction for learning about energies, especially alternative energies, and environment. A board of committee was appointed to conduct studies for potentialities and limitations. More elaborate and defined ideas for tourism and recreational activities will be highly appreciated for further planning and development. However, there are legal conditions in accordance with the Minerals Act B.E. 2560 (A.D. 2017), Royal Forest Department, and Department of Primary Industries and Mines, as well as regulations regarding rehabilitation and environmental impact assessment required by the Office of Natural Resources and Environmental Policy and Planning. The rehabilitation plan is for the mine site and special committee was formed. The post- mining use of electricity generation site is also in the plan, and a board of committee will be formed later. Recreation is one of the reclamation strategies of Mae Moh Mine. Turning an inactive mine site into a recreational park, or a public park is one of the compulsory activities (apart from other choices such as tree plantation) to satisfy the reclamation and rehabilitation category, but no tourism activity is mentioned. There is high potential to turn this area into a place for tourism and recreation use. The main points in this issue include approaches for how the mine, the power generation structure, workshops and offices, and ash dump sites may possibly be adaptively reused for tourism and recreational purposes. There have been studies of international practices for mines after their closures of operation. The vision so far is to possibly turn the mine into a lake for water sports (with high consideration of safety from toxic and underground water). Redesign of mine landscape is highly required. Around the mine site can be designed to be trails for biking, with tree plantation. As observed, the bike routes mainly offer countryside views and views around the reservoirs. Currently, every year there is an annual Mae Moh Festival, in which biking is a tradition as well. Bike trails within the mine are designed for bikers who join the event. Future development is of high potential. Moreover, unused machinery is valuable representing the heritage of industrialization. In mining industry, old aged machines no longer used are full of significance indicating length of their use and technology of the past. The interview also raised an issue of conservation for these unused machines, including structures at the power plant. However, many structures may possibly be removed (with consideration) as most of the land belongs to the Royal Forest Department. It is the requirement stated in the Mining Act about uses of national land property for mining industry, that after the closure of mining operation, the land must be rehabilitated; the structures and machines must be removed from the site. Some buildings may be remained such as offices and workshop buildings.

The focus group discussions were also carried out with the communities nearby, especially the active ones in tourism and agricultural activities, which are Baan Mai Na Kham Community and Baan Moh Luang Community. The participants who attended the focus group discussions include 11 participants from Moh Luang Community, and 20 participants from Baan Mai Na Kham Community. These include the community heads, those who are local entrepreneurs, work in the agricultural sector, homestay and tourism and the community's OTOP and other household product sector. The main purpose of the discussions was to acquire local people's perception and recollection on *'what is their heritage and how (industrial/mining) heritage mean to them'*, and their opinions on cultural and tourism development that help connect the

mine and the communities. The overall reflections of the discussions coincided with the fact that Mae Moh Mine is the key organization that has run many corporate social responsibility and community development activities to support the well-being of the communities in the neighborhood. Mae Moh Mine has brought local people to work mainly about maintenance and rehabilitation of the mine such as tree plantation. As well, Mae Moh Mine has the plan to motivate local people to learn more skills in the maintenance and rehabilitation work while mining is still in existence. From the focus group discussions, the representatives of both communities, generally they have similar memories about their living in the past before moving to the new land allotted by EGAT. Most recalled the rural and agricultural living in a kinship environment. They did rice farming and vegetable plantations and household domestication. The mental center of the people was the same ones such as school, village head and temples. However, the people of Baan Mai Na Kham recalled a public space with a huge tree in the middle at the intersection near the entrance to the mine. Yet, the evidence disappeared. The people of Baan Moh Luang rather emphasized on their old tradition called “Fabric Elephant Parade” (Figure 3) which has been practiced since their homeland was in the mine land. Today, this tradition is still practiced. The tradition has been practiced by the group of Ngiew or Tai Yai tribal people who migrated from Myanmar to settle along the Mae Moh stream or around Baan Moh Luang today in Mae Moh District. The belief behind this tradition associates with Doi Pha Chang (the natural shape looks like two elephants), the mountain believed to be sacred of Mae Moh people. Today, the mental center of the people today apart from temples and school, lies on a more political and administrative institution. What this means is that the villagers’ viewpoint and dependence is on established group and network with the mutual economic benefits sought, and appropriate public space is necessary for use. Therefore, their center includes the house of the village’s head, the village’s learning center and meeting hall where villagers of all ages meet, and the park for exercises. Baan Mai Na Kham has a place where youth gather to practice playing musical instrument, whereas Baan Moh Luang has a public hall where villagers gather to help arrange the village’s fairs and traditions. Baan Moh Luang has a City Shrine which people gives a great respect, and the wooden Main Hall (Figure 4) nearby which was once detached in order to move from the old homeland to the area at the present, and reassembled using these old woods. The Hall displays their Tai Yai ancestors and the cultural traditions of the village as to disseminate their identity.



Figure 3: Fabric Elephant Parade

From <http://maemohlampang.blogspot.com/2011/08/blog-post.html>



Figure 4: The Wooden Main Hall
The photo taken by the author

When asking about their perception/ recollection on ‘*what is their heritage and how (industrial/ mining) heritage mean to them*’, most participants agreed that their general local traditions such as Songkran, Loi Krathong, folk entertainments and the village’s animistic rituals such as worshipping the village’s guardian/ territorial spirit connect with their heritage perception. They also mentioned that their ancestors and local scholars who had spiritual knowledge and wisdom are their heritage. Focusing on the industrial heritage, all participants expressed that the mine and the reservoirs were their heritage, as they stated that ‘*The Mine has been with us very long time ago, before those buildings and machines*’ (*those buildings and machines refer to office buildings, plants and machines used in electricity production by EGAT, the author*). This may imply that they are not quite certain whether the plant, buildings and machines are their heritage, but they rather feel connected with natural land and water. A more specific question was asked as in ‘*how do they feel when seeing those industrial objects and plant buildings or when taking photo with them (i.e. huge vehicles)*’. Most

could explain about the grandness of vehicles and the structure of the electricity plant units, and related them to their pride in expressing this grandeur. Yet, the industrial landscape as they perceive is defined by hugeness, untidiness, loud noise, dust from industrial activities and transportation, unpleasant smell and vibration from industrial activities, abandonment of sites. Even though the participants could not say whether they felt of any aesthetics or beauty of the industrial landscape and objects, some of them related the mine landscape with the feeling of loneliness, nostalgia and a memoir to their old homeland, as well as associating the new (totally transformed) landscape of the mine with the old landscape they have remembered, as some expressed: *'I feel lonely when I look at the mine'*. *'I miss the homeland'*. *'Once we passed the mine, we tried recognizing which part of the mine used to be our settled land in the past'*. Furthermore, it seems that an amaze they have towards the mine landscape is the layers of the mine and activities that show movement in the mine. Also, there were people who felt that the reservoirs had a beautiful landscape and that they were the heritage of communities. Additionally, there was a memory about the time when the train was used for transporting coal to Bangkok in the past.

In regards to potential of tourism development, whereas Baan Mai Na Kham seems to be active in making a vibrant economy on trades and agriculture, Baan Moh Luang is known more in terms of cultural tourism with a unique tradition of Fabric Elephant Parade. The focus group discussions revealed that Baan Mai Na Kham followed the King's Philosophy of Sufficiency Economy through agriculture. The community head has also worked hard and successfully established a learning and career development center for the community members so that the members can be trained and have household work to do for earning. A trade center or market called SML Market was also developed with a determination of turning the community into a trade hub of Mae Moh District. Baan Moh Luang, the community located in the opposite side of Baan Mai Na Kham, has developed its tourism by using cultural and natural resources. The discussions of both communities on tourism potential based on the industrial heritage unveiled possibility in development and improvement of the mine landscapes and uses of old vehicles and machines as landscape decoration. The people of Baan Mai Na Kham said that they would like to see tourism activities and routes that connect potential villages, with a capability in attracting more regular visits of general tourists or visitors, apart from government groups who make official visits. A souvenir center, a visitor learning center and economic route of the village should also be set up. For Baan Moh Luang, the difference is that the community is more active in running the tourism. It joined the Community Tourism OTOP Nawat Withee Project (Nawat Withee means a combination of innovation and way of life). It also joined the project called Lampang Plai Tang Fan or Lampang Open House; the project is to promote and stimulate year-round tourism of Lampang through showcasing the provincial uniqueness in historical, cultural, agricultural dimensions, including crafts and innovation, which are considered *'The Best of Lampang'*. Baan Moh Luang has also run homestay with tour program. Additionally, both communities have vision of developing cultural routes and agro-tourism.

Discussion

The findings from the field survey of physical evidence of the mining heritage of Mae Moh Mine, the in-depth interviews with Mae Moh Mine's key informants, and the focus group discussions with communities in the neighborhood of the mine contributed to suggestion on alternative tourism approach based on the industrial heritage. The study also referred to some outstanding international case studies where transformation of the industrial heritage into new purpose with conservation had been successfully developed, both in the Asian and European context. The findings led to the sum up of idea of mining heritage tourism potential within the area of Mae Moh Mine. The interview gave the summary idea of tourism and recreational potentialities falling into the following directions:

1. Focusing on the architectural characters of huge structures of buildings and machines for visual scenic point and sightseeing
2. Tourism and recreational activities that create connectivity of people to the old mine site and electricity power generation site. However, these require more discussions for possible ways for tourism activities due to high concern of degree of appropriateness of mine land character to be used for tourism and recreational activities, law and safety issues.
3. Landscaping with green/ ecological and energy park concept
4. Landscaping for bike routes that link areas in the mine complex with the areas outside
5. Museums that narrate stories of old machines and vehicles associated with mining and transportation
6. Design of site for events and fairs with the industrial heritage backdrop

Taiwan and China are good example of how former industrial sites were transformed into tourist place and uses of machinery as landscape decoration. Beijing's 798 Art Zone (Figure 5) applied an adaptive reuse approach. The factory was transformed with art concept as the name represents. It is notable that art was used as propaganda (propaganda art) in China (Beijing) with the open and presentation of the Factory No. 789 and other factories within the complex (Dekker, n.d.). One of the physical uniqueness of 798 Factory Complex is the group of industrial buildings in Bauhaus architectural style, very economic but functional, and thus appealing to Chinese urban planners who were faced with scarcity in the post-1949 era. The Taiwan case of applying the ecomuseum concept to Houtong Coal Mine Ecological Park (Figure 6), Daxi Wood Art Ecomuseum (Figure 7), Jingtong Mining Industry Museum, and Gold Museum (Figure 8) is also useful. The industrialization of Taiwan had been greatly boosted during the Japanese colonization for 50 years, during 1895 - 1945. Under the Japanese occupation period, there had been several industrial productions in Taiwan under the Japanese monopoly business system, resulting in the majority of remaining industrial heritages such as sugar refineries, wineries, and mining industry (Hsiung Tsai, n.d.). To adaptively reuse these former industrial sites, there was an integration of the historical and cultural elements based on the historic industries (gold, coal mining and wood craft) with the natural characters of the sites, the local lifestyle, and the social process. This transformation was successful by the participatory process among public sector, local people and private sector; application of international principle of authenticity and integrity during the preservation; use of local manpower and visitor number control for preventing

degradation of the living environment or the quality of life (Hui Liu and Jaan Lee, 2015). In the case of Houtong Coal Mine Ecological Park, the implementation for some mining artifacts includes restoration and transformation of them into exhibition and tourism functions. The boundary of this old coal mine takes in the mining villages of Guangfu Village, Houtong Village and Gongqiao Village, and therefore participation from the surrounding villages is a catalyst. For the New Taipei City Gold Museum, the theory of ecomuseum suggests the idea to operate a museum that incorporates industrial heritages, resources of landscape, tourism and travel, in order to sustain regional economy and cultural development (Hsiung Tsai, n.d.). The transformation of gold mining site into the Gold Museum was under an attempt to transform the local economy to the mining culture tourism. This ecomuseum impressively showcases the industrial, the cultural and the natural landscapes dwelling and surrounding the complex. The cases as the examples from Taiwan sound to respect a practice of balancing between the preservation and development needs by bolstering local community participation with supports of public and private sectors, and combining the industrial part with the community cultural and natural parts, making an ecomuseum concept become concrete

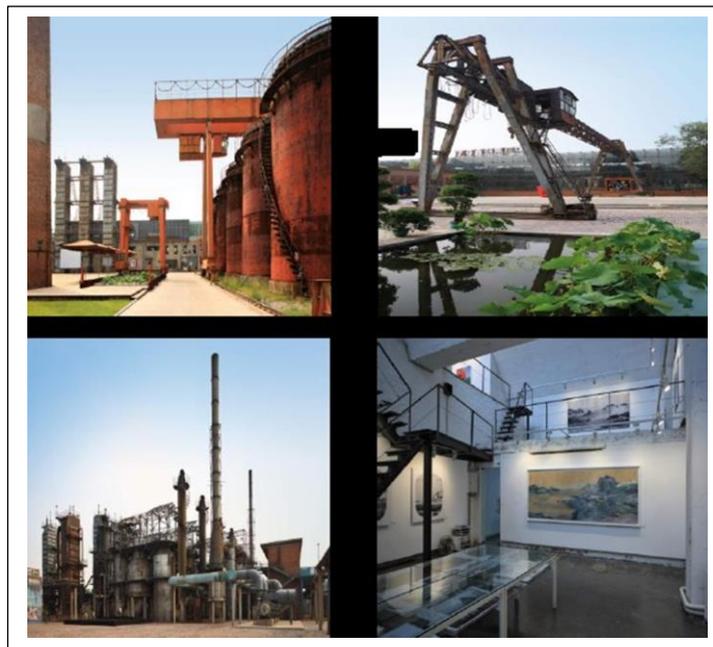


Figure 5: 798 Art Zone, Beijing

From <https://www.area-arch.it/en/beijing-iconicaniconic-798-art-zone>



Figure 6: Houtong Coal Mine Ecological Park, Taipei
From https://tour.ntpc.gov.tw/en-us/Attraction/Detail?wnd_id=85&id=111585

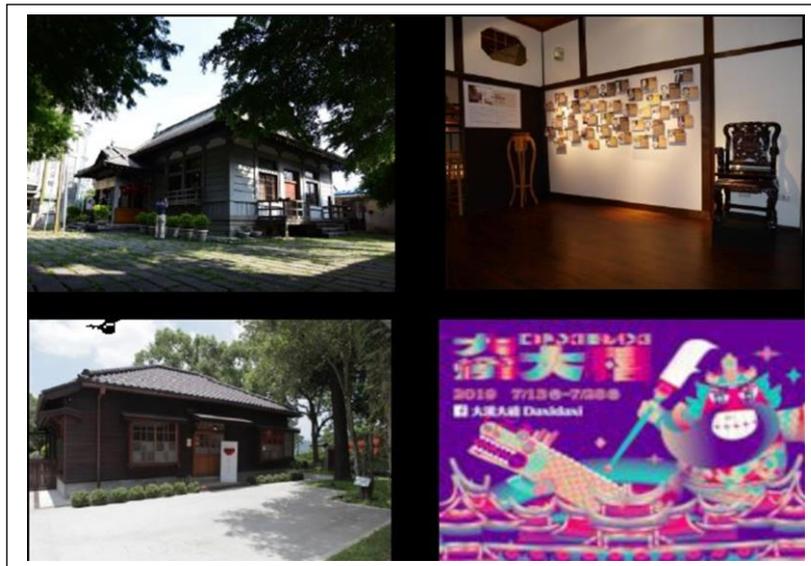


Figure 7: Daxi Wood Art Ecomuseum
From <https://wem.tycg.gov.tw/en>



Figure 8: The Golden Museum (or New Taipei City Gold Museum)

From <https://www.gep-en.ntpc.gov.tw>

The European mining heritage case studies revealed that most mines already ceased in their operations. The closure brought to the idea of finding alternative development based on mining landscape, machines and buildings. Successful transformation is usually in the mines that have vast landscapes and physical evidence of mining and related industrial activities are mostly intact. An example is the case of the Mining Area of the Great Copper Mountain in Falun, Sweden (European Route of Industrial Heritage), which is the UNESCO World Heritage Site (Figure 9). This former copper mine showcases an impressive interpretation of the mining town and the mine landscape, while remaining the authenticity and integrity of the site. The site itself is like an outdoor museum with the mine dominating the site, offering historical content that combines industrial, social, cultural and economic values through the industrial and domestic remains of copper production industry in the natural landscape. Walk tour to underground tunnel to see copper mine and listen to miners' stories is an example of educational tour bringing visitors close to the reality of miners' working conditions and life underground. A more leisure and relaxing form of visit is when visitors can walk around the Great Pit with the views of an array of historic wooden houses which were formerly miners' residential settlements, and a Baroque church as another backdrop of this site. This copper mining town was set in the landscape that narrates in itself both the industrial and cultural fabrics of the site during the late 17th and 18th century (Palmer and Neaverson, 1998, p. 13). Folk events and festivals also take place as an example of how the mining space is used in the cultural sector.



Figure 9: The Mining Area of the Great Copper Mountain in Falun, Sweden, UNESCO World Heritage Site
From <https://www.erih.net/i-want-to-go-there/site/show/Sites/falun-mine-world-heritage>

The case of the Ruhr Area, Germany is another impressive example in the regional scale. Ruhr Area is one of the largest industrial regions in Germany, and it was an important home for coal mine production and steelworks in the late 18th century. The industrialization transformed the region from the rural region to a heavily urbanized region, making it become the economic heartlands both of Germany and the continental Europe (Berger, et al , in Wicke, et al., 2018, p. 74). The Ruhr is a good example of using the space for organizing different events and exhibitions showcasing different content based on individual industrial sites such as the story of energy at the Gasometer, or the Duisburg Landschaftspark (Figure 10) that became home to refugee birds and plants as well as a diving basin and stages for music and drama (ibid, p.82). Another site is Zollverein Coal Mine Industrial Complex in Essen (Figure 11), the UNESCO World Heritage Site, located in Land Nordrhein-Westfalen, consisting of the complete infrastructure of a historical coal-mining site, with some buildings from the 20th century, with outstanding architectural merit (UNESCO World Heritage Convention). The site epitomizes the industrial heritage that constitutes remarkable material evidence of the evolution and decline of coal mining industry during the past 150 years. It is claimed as the most beautiful coal mine in the world; the masterpiece of mining architecture with the symmetrical arrangement of buildings and facilities with design that gives impressive details and art aspect (The UNESCO-Welterbestätten Deutschland e.V.). There are various themes for visitors to catch the atmosphere and knowledge of the mining industry history, such as ‘Path of Coal’, ‘Ruhr Museum’, ‘Fascination of the Ruhr

Metropolis, 'the Dramatic History of Industrialization and Structural Change in the Ruhr Area', 'the Night of Industrial Culture', 'Contemporary Art Ruhr', 'Industrial culture meets wild nature' and 'Gourmet Miles and Food Festivals'. The image of ugly industries at the Ruhr Region was changed and the new identity of the industrial heritage was formed through gradual adoption of leisure culture into the region (ibid, p. 84). This practice shows a vision that combines the regeneration of environment, economy and society that the former industrial sites can do for contemporary uses and benefits.

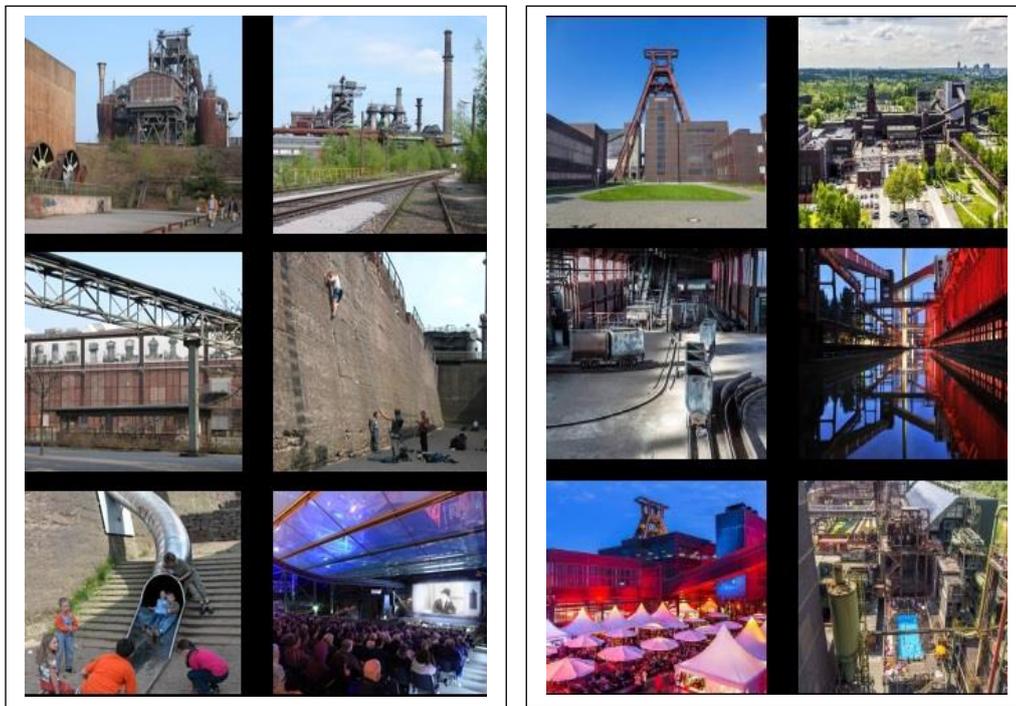


Figure 10: Duisburg Landschaftspark,
Ruhr Area, Germany
From <https://www.erih.net/i-want-to-go-there/site/show/Sites/north-landscape-park>

Figure 11: Zollverein Coal Mine Industrial
Complex in Essen, UNESCO World Heritage Site
From <https://whc.unesco.org/en/list/975/gallery>

For the case of Mae Moh Mine, main attractiveness with the industrial heritage atmosphere lie on the physical landscape of the mine as a scenic view, the park that is laid out and decorated with old huge machinery and vehicles used in mining for almost 30-35 years, and the museum that narrates the geological aspects of coal and how to produce electricity from it. This valuable machinery can be classified into the machinery for excavation such as locomotive, rail cargo; machinery for transportation such as mine cart, locomotive, belt loader and truck ramp; and machinery for other auxiliary uses such as water pump, road roller and portable fire extinguisher. These machines were used during the 20th century or for at least 20 years. Its large landscape creates a potential of reuse (and perhaps transformation) of these machines, with interpretation techniques. Mining heritage tourism, once proposed for further policy and planning for future

development, could give contribution to generation and distribution of community cultural tourism by connecting the Mae Moh Mine as the magnet where tourists or visitors could be distributed to engage other cultural or agricultural tourism run by communities. Lampang tourism authority can also integrate the existing tourism with mining cultural heritage and geo- heritage related tourism, which finally offers alternative tourism experience to visitors to town.

Suggestion

There is a potential of mining heritage tourism to be developed at Mae Moh Mine, while connecting with the tourism run by the communities nearby. The mining heritage of Lampang has so much to do in the future as it is home to many historic vehicles and machines for creating outdoor museums, and lands for recreational playgrounds, industrial landscape park/ eco-park development. It is not necessary to wait until a cessation of the mine's operation, but mining heritage- based tourism development can be initiated from now on. The landscape has future potential for more active reuses by transformation of the existing space and machines. Routes to be developed distributing from the mine to the communities' attractions nearby could also be designed. Today limitation is on the related laws and regulations of land uses, which requires further consideration and refinement. Reuse of the space for tourism and recreational purpose has been attended by EGAT Mae Moh. Additionally, apart from providing the content of how to produce electricity as the museum already has, Mae Moh Mine may start to manage the data and produce the content about sewage treatment technology that treats waste water from mining and electricity production activities, as part of the museum interpretation plan. This content supports positive publicity of coal mining industry. To apply the international practices in the case of mining reused in tourism to the current case of Lampang, it is necessary to look into laws and regulations that concern land uses and conservation as the mine land belongs to the Royal Forest Department. The case of the Mining Area of the Great Copper Mountain in Falun, the government provided the mineral strategy with aim to increasing competitiveness of the Swedish mining and minerals industry in sustainable way. The strategy incorporates ecological, social and cultural dimensions for preservation and development. There are strategies that contribute to sustainability of the mining industry of Sweden, emphasizing other values of mining areas than the industrial and production values such as natural and cultural values, after the operations have ceased, including utilizing the mining cultural environment in tourist industries. This opens to further conservation and development projects for other uses in order to sustain their mining landscapes. This shows in their vision of creating a harmony between mining and minerals industry with environment, culture and other industries, as well as promoting attractive natural and cultural environment to mining communities nearby (Swedish Ministry of Enterprise, Energy and Communications). Therefore, the case of Mae Moh Mine requires active consideration and discussions on relevant laws and policy on land uses and conservation specifically for the industrial heritage. Also, as perceived from the focus group discussions with local people, huge structures with minimal decoration or none to the structures may not be perceived to be much attractive to general Thai visitors. This becomes one of the challenges in applying unused structures and machines

survived from the mining operation to be an attraction point. Strategies that promote social interactions with the built structure and creative transformation for the landscape would be helpful in attracting visitors.

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