JAK/CLT/2026/PI/01

The Industrial Heritage of South-East Asia

A Thematic Regional Study

Edited by Gabriel Victor Caballero & Miles Oglethorpe



© UNESCO 2026

This report was carried out by experts from the International Council on Monuments and Sites (ICOMOS) and from The International Committee for the Conservation of the Industrial Heritage (TICCIH), commissioned with the support of UNESCO Regional Office in Bangkok and in collaboration with UNESCO Regional Office in Jakarta and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C).



This report is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) licence (http://creativecommons.org/licenses/by-sa/3.0/igo/)
The designations employed and the presentation of materials throughout this report do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The idea and opinions expressed in this report are those of the authors; they are not necessarily those of UNESCO and do not commit the organisation.

Editors
Gabriel Victor Caballero & Miles Oglethorpe

Managing Editor
Giacomo Martinis

Contributors *(in alphabetical order)*
Pauline Basilia, Supradith Chitagon, Parinya Chookaew, Jaclyn Chua, Malen Chung, Louise Court, Eugene Raymond Crudo, Richard Engelhardt, Dominic Galicia, Adrian Han, Ivan Anthony Henares, Ho Weng Hin, Rungsima Kullapat, Leedom Lefferts, Lim Take Bane, Timothy Augustus Ong, Pham Thuy Loan, Maya Rosa, Sakona Loeung, Pinai Sirikiatikul, Supitcha Sutthanonkul, Hasti Tarekat, Narathip Thubthun, Johannes Widodo

Cover and Back Cover: Details of murals inside the main hall of Tangjong Pagar Railway Station, Singapore. These comprise ceramic tiles designed by William Rowe of Doulton & Company, depicting commerce and industry, including rubber tapping. Photograph by Studio Lapis (2014). CC-BY-SA 3.0 IGO

Graphic Design, Illustrations and Layout
Gerald Regalado

In collaboration with

TICCIH The International Committee for the Conservation of the Industrial Heritage

ISC20C International Scientific Committee on 20th Century Heritage

The Industrial Heritage of South-East Asia

A Thematic Regional Study

Edited by Gabriel Victor Caballero & Miles Oglethorpe

THE INDUSTRIAL HERITAGE OF SOUTH-EAST ASIA

A Thematic Regional Study

Collated and edited by Gabriel Victor Caballero & Miles Oglethorpe in association
with TICCIH and ICOMOS ISC20C for the UNESCO Regional Office in Bangkok

TABLE OF CONTENTS

1 Executive Summary 1

2 Introduction - Purpose, Aims and Methodology 7

3 Defining Industrial Heritage 13

4 Essays Setting the Scene in South-East Asia 27

4.1 *Industrial Heritage in South-East Asia: From Pre-Industrial Societies to Nation Building* **28**
4.2 *The Pre-Modern Industrial Heritage of South-East Asia: Concepts, Definitions, Identifications* **36**
4.3 *Navigating the Complex Legacy of Industrial Heritage in South-East Asia: A Critical Perspective* **55**
4.4 *Reading South-East Asia's Industrial Heritage through the Twentieth-Century Historic Thematic Framework* **61**

5 National Reports and Selected Sites 68

5.1 **Indonesia 69**
Industrial Heritage in Indonesia: A National Summary
Selected Sites **74**
5.2 **Malaysia 105**
The Industrial Heritage of Malaysia, the Golden Chersonese of Ancient Times
Selected Sites **110**
5.3 **Myanmar 159**
Historical Overview of Myanmar's Industrialisation
Selected Sites **166**
5.4 **Philippines 180**
National Industrial Narrative of the Philippines
Selected Sites **191**

5.5 **Singapore** **240**
Engines of Change: The Making of Industrial Singapore
Selected Sites **256**
5.6 **Thailand.** **292**
Thailand's Industrial Transformation
Selected Sites **297**
5.7 **Viet Nam** **335**
National Summary and Timeline
Selected Sites **342**
5.8 **Cambodia** **368**
National Industrial Narrative of Cambodia
Selected Sites **375**
5.9 **Brunei Darussalam** **383**
National Summary and Timeline
5.10 **Lao People's Democratic Republic** **386**
National Summary and Timeline
5.11 **Timor-Leste** **389**
National Summary and Timeline

6 Conclusions and Looking Forward **392**

A1 Annex 1 . . . . . **397**
Long Lists of Industrial Heritage Sites

A2 Annex 2 . . . . . **438**
Contributors' Biographies

1

Executive Summary

Executive Summary

This study is situated within two complementary frameworks. First, it builds on the experience of the comparative research reports developed by The International Committee for the Conservation of the Industrial Heritage (TICCIH) to guide the identification, evaluation, and protection of significant industrial heritage of specific sectors or geographic areas. In parallel, it is a contribution to the further development of the *Global Strategy for a Credible, Representative and Balanced World Heritage List,* adopted by the World Heritage Committee to broaden the definition of World Heritage to better reflect the full spectrum of our world's cultural and natural heritage. This is also part of a comprehensive framework and operational methodology for implementing the World Heritage Convention.

In particular, this initiative directly responds to the Third Cycle of Periodic Reporting in Asia and the Pacific and to its Regional Framework Action Plan (2023–2030), adopted at the 45th session of the World Heritage Committee (Riyadh, Saudi Arabia, 2023). It addresses the identified need for thematic studies to support the identification of cultural and natural heritage within each State Party and the development of comprehensive national inventories. In this context, industrial heritage was identified as a key under-represented category during the *'Tentative List Updating and Harmonisation for South-East Asia'* capacity building workshop organised by the UNESCO Regional Office in Bangkok in August 2024. States Parties highlighted several industries such as tin mining, railway infrastructure, tea production, cement manufacturing, forest industries, and sugar production as warranting significantly greater attention.

In response, UNESCO decided to undertake a thematic study focusing on industrial heritage in South-East Asia, in collaboration with TICCIH, the International Scientific Committee on 20th Century Heritage (ISC20C), the relevant States Parties, and heritage experts, thereby combining regional and international expertise. The Twentieth-Century Historic Thematic Framework, applied where relevant, provided an important methodological tool for identifying and assessing heritage places.

Overall, the study aimed to identify significant sites across the region and to document national perspectives and narratives related to industrial heritage. It also provided a preliminary assessment of conservation conditions, as well as of relevant national policy frameworks and statutory protection measures. Lastly, given the novelty of such a study in the context of a relative paucity of relevant research and existing scholarship on the subject, it sought to explore how industrial heritage is expressed by South-East Asia as a distinctive heritage category and to better understand its significance.

Structure of the Study

Chapters 2-4 provide the introductory framework, presenting the conceptual foundations of industrial heritage and its relevance within the specific context of South-East Asia. These chapters include contributions from a variety of leading heritage practitioners and scholars from across the region.

Chapter 5 constitutes the main body of this work. Prepared by the respective national teams, it comprises summary national reports alongside a selection of industrial heritage sites and practices referring to each participating country. In general, each country team identified approximately ten significant heritage sites and practices. However, the number of entries, as well as the length, type, and

level of detail of the information provided, vary depending on the availability of relevant information and human resources. The final sections of this Chapter include the summary national reports prepared by the editorial team on behalf of countries with limited information available or that were unable to contribute directly.

Chapter 6 presents the overall conclusions of the study as drawn by the editors. Reflecting the exploratory nature of this work, extended datasets referring to heritage sites and practices of potential significance are included in Annex 1.

Main Outcomes

This study is the first coordinated effort to collect information relating to industrial heritage in South-East Asia and, as such, it builds a critical baseline for structuring future initiatives. Key outputs include the mapping of relevant stakeholders; the collection of academic, grey, and informal literature and existing studies on the subject; the identification of relevant policy instruments; the recognition of gaps in regulatory frameworks; and a first assessment of the state of conservation concerning these sites and their associated needs.

Additionally, while the initial scope of this study was framed predominantly by the World Heritage Convention (and so focusing primarily on tangible heritage), this expanded considerably over the course of its development. In particular, a substantial proportion of contributions (approximately 27%) addressed or were related to practices of the industrial tradition specific to South-East Asia, engaging with a broad range of cultural expressions from across the region. As a result, industrial heritage in South-East Asia emerged as of multi-programmatic relevance for UNESCO's action in the field of Culture (in line with its 1972, 2003, and 2005 Conventions), and points to future opportunities in cross-sectoral initiatives.

A key outcome of the study is the establishment of the roots of new network of industrial heritage correspondents across the region. This must also be seen in light of the study's reliance on voluntary contribution from individuals with diverse backgrounds, experiences, and levels of expertise. Accordingly, this work represents the initial step in longer journey. While there are clear strengths in its formulation, gaps and limitations remain, and significantly more industrial heritage sites and practices are likely to emerge as awareness and appreciation grows across the region. This is the beginning of an exciting process.

This study suggests the need to build on this foundation through targeted future actions, including consolidating and expanding the network of correspondents and establishing contacts in countries that have not participated in this initial phase, in order to better understand the range of sites, practices, and heritage programmes in other contexts. It also considers potentially updating the report at a suitable moment in the future and organising both on-line and in-person events to promote its findings while supporting capacity-building. Central to these efforts will be the development of meaningful partnerships, including strengthening existing collaborations and engaging additional stakeholders identified during the study.

Overall, the study provides the critical foundation for articulating a more comprehensive understanding of the distinctive characteristics of industrial heritage in South-East Asia. While underscoring the importance of documenting under-recognised heritage, it contributes to broader reflections on this heritage category in particular that may be of relevance and applicable across Asia and the Pacific, and highlights the need of sustained commitment and coordinated action to supports its identification, appreciation, and conservation.

Country	Entry	Industrial Classification																Tangible	Intangible
		Agricultural and Fishing	Chemicals	Clothing and Footwear	Communications	Energy	Engineering	Extraction	Food and Drink Processing	Forest Industries	Insfrastructure	Industrial Communities	Metallurgy	Mineral Products	Paper, Glass and Packaging	Textiles	Transport	Other:	Associated with 'monuments, groups of buildings, or sites'	Associated with 'practices, representations, expressions, knowledge, or skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith'
Indonesia	Barus									●									●	●
	Deli Tobacco Hospital											●							●	
	Dutch Colonial-Era Sugar Factories								●										●	
	Lasem															●			●	●
	Ombilin Coal Mining Heritage of Sawahlunto					●		●											●	●
	Pabrik Indarung I PT Semen Padang													●					●	
	Pabrik Kina Bandung									●									●	●
	PT Pindad's Military Weaponry						●												●	●
	Rumah Atsiri		●																●	●
	Salt Production at Sumenep								●										●	●
Malaysia	Ancient Iron Smelting Industry of Bujang Valley, Kedah							●											●	●
	The First Rubber Tree and the Rise of Malaysia's Rubber Industry									●									●	
	Rubber Smoke House in Lunas, Kedah									●									●	
	The Rubber Research Institute of Malaysia in Kuala Lumpur									●		●							●	
	Floating Tin Dredges of Malaysia							●											●	
	Sungai Lembing Tin Mine and Town							●				●							●	●
	Royal Selangor												●						●	●
	The Textile Weaving Traditions of the East Coast															●				●
	The Traditional Boat-building Industry of Pulau Duyung, Terengganu						●										●			●
	The Charchoal Kiln Factories of Kuala Sepetang, Perak					●													●	●
	The Sayong Pumpkin (Labu Sayong) Pot														●					●
Myanmar	Plate Factory (Baganset)													●					●	●
	Burmah Oil Company					●													●	
	Sat San Warehouse																●		●	
	Yangon Central Railway Station										●						●		●	
	The Botahtaung Jetty										●						●		●	
	The Namtu-Bawdwin Mines							●											●	
	The Gokteik Viaduct, Northern Shan State						●												●	

Philippines	Balara Filters Park									●	●						●		
	Manila Customs House / Bureau of Customs Building														●		●		
	Abaca Heritage of Davao	●								●	●						●		●
	El Depósito, known today as the Museo El Deposito									●							●		
	Hawaiian-Philippine Company Sugar Central	●						●			●						●		●
	The Minor Basilica and Parish of San Sebastian						●									Religious Infrastructure	●		
	Spanish Lighthouses of the Philippines														●		●		
	Tutuban Station														●		●		
	University of the Philippines Los Baños	●						●	●		●					Research and Educational Facilities	●		●
	Victorias Milling Company (VMC)							●			●						●		
Singapore	Thow Kwang Dragon Kiln								●		●					Cottage Industries; Secondary Industries	●		●
	Former Tong Nam Tobacco Co.	●														Processing and Manufacturing Industries; Secondary Industries	●		
	Sembawang Shipyard or Sembawang Naval Base				●		●			●	●				●	Military	●		●
	McGraw-Hill Far Eastern Publishing Factory										●			●			●		
	Cooling Systems & Flexibles Factory		●			●	●				●						●		
	JTC Flatted Factories at Tanglin Halt										●					Light Industries	●		
	Singapore Time Pte Ltd (Seiko Factory)						●				●					Precision Manufacturing	●		
	Prima Flour Mill							●									●		
	Lee Rubber Warehouses at Geylang Bahru														●		●		
	Pasir Panjang Power Station					●				●	●						●		
	Telok Blangah Substation					●				●	●						●		
	Shell-Bukom's Clubhouse/ Residential Complex					●					●						●		
Thailand	Earthenware pottery production – Thai-Khorat process (Type A)							●			●					Pottery			●
	Makkasan Rail Depot						●								●		●		
	Northeast Thailand Rock Salt Pit												●						●
	Siamese Canal System									●							●		
	The 'Rahad' Waterwheels of Lamtakong	●								●						Irrigation	●		

	The Thai Paper Mill													●				●	
	Thonburi Naval Dockyard						●									●	Military	●	●
	Tin Industry Heritage along the Andaman Coast												●					●	
	Phrae Basin's teak Forestry Heritage								●									●	
Viet Nam	Dalat Train Station															●		●	
	Gia Lam Railway Factory						●									●		●	
	Hanoi Brewery							●										●	
	Hoa Binh Hydroelectric Power Plant					●												●	
	Long Bien Bridge									●						●		●	
	Mong Bridge									●						●		●	
	Thu Duc Water Treatment Plant									●								●	
Cambodia	Royal Railway									●						●		●	
	Cambodia Beverage Company-Commercial Office							●										●	
	Glass Factory													●				●	

TOTAL	**70**
Agriculture and Fishing	**6**
Chemicals	**2**
Clothing atnd Footwear	**0**
Communications	**1**
Energy	**8**
Engineering	**10**
Extraction	**6**
Food and Drink Processing	**8**
Forest Industries	**8**
Industrial Communities	**18**
Metallurgy	**2**
Mineral Products	**5**
Paper, Glass and Packaging	**4**
Textiles	**3**
Transport	**18**
Tangible (92.86%)	**65**
Intangible (32.86%)	**23**

2

Introduction
Purpose, Aims and Methodology

Introduction: Purpose, Aims and Methodology



Gabriel Victor Caballero

Director of CALAHE Environmental Consultancy Services, Former ICOMOS Focal Point on Heritage and Sustainable Development

Mr. Gabriel Caballero is the Director/ Principal Consultant of CALAHE Environmental Consultancy Services, a company dedicated to safeguarding heritage places and developing appropriate interventions for urban and rural landscapes. Previously, he served as the Focal Point for the UN Sustainable Development Goals for ICOMOS, representing the organisation in key global fora including the UN-DESA and UN Habitat Expert Meeting in Spain in 2023. He also represented ICOMOS for the UNESCO Mondiacult World Conference in Mexico City in 2022, provided the report of cultural heritage and sustainable development during the 44th Session of the World Heritage Committee in China, and was an invited expert by ICCROM for the 'Collections, Conservation and Sustainable Development' Programme in Cambodia in the same year.

Back in 2018, Mr. Caballero was part of the researchers for the mASEANa conference, wherein he investigated the development of sports and architecture in the Philippines during the early 20th century. He has also published articles about the trends of urban heritage research in Asia and embarked on a detailed study of the Singapore Botanic Gardens and its significance to the wider social and scientific realms of Singapore and South-East Asia.

Industry and Heritage in South-East Asia

Industry has played a fundamental role in the historical development of every country in South-East Asia. However, the manifestation of its significance, its tangible and intangible heritage, is often so deeply embedded in everyday life that it remains barely recognised. As articulated in the *2011 Modern Asian Architecture Network (mAAN) Seoul Declaration on Industrial Heritage in Asia,* recognising, understanding, interpreting, and harnessing industry as heritage presents particular challenges in the Asian context. This is largely because industrial activity remains living and continuous, without the temporal distance that often allows societies to reinterpret its meaning. In addition, certain industries carry painful historical associations of labour relations, economic realities and political influences, making some sites difficult to discuss. As a result, industrial heritage has frequently been overlooked across Asia and in South-East Asia in particular.

A significant milestone was reached in 2019, when the World Heritage Committee, meeting in Baku, inscribed the first industrial site in South East Asia on the World Heritage List. *The Ombilin Coal Mining Heritage of Sawahlunto* in Indonesia marked an important step in raising awareness of the region's industrial heritage (UNESCO, 2026). Nevertheless, this inscription represents only the "tip of the iceberg", as many industrial sites remain undocumented and are increasingly at risk of being forgotten or lost. During the *'Tentative List Updating and Harmonisation for South-East Asia'* capacity building workshop organised by the UNESCO Regional Office in Bangkok in August 2024, it was recognised that

industries such as tin mining, railway infrastructure, tea production, cement manufacturing, forest industries, and sugar production merit significantly greater attention.

The present work is a follow-up to this event, aimed at enacting the initial reflections which had been developed. Defining industrial heritage was a very important step when we began this process. It was needed to ensure consistency in crafting this study. We adopted the definition of industrial heritage found in the *Dublin Principles,* which were developed jointly by TICCIH and ICOMOS in 2011. In summary, industrial heritage can comprise tangible heritage in the form sites, structures, landscapes, machinery and objects (ICOMOS & TICCIH, 2011). It also involves processes of production and the extraction of raw materials, for instance through mining or through agricultural production, and their transformation into goods, materials, and energy as well. Usually linked to these activities is infrastructure (transport in particular) such as railways, canals, ports and harbours, including navigational features such as lighthouses. Some of these structures can be iconic and of global significance.

In the past, industrial heritage has tended to focus on production, with a prominent focus on the period of the so-called Industrial Revolution and the 20th Century, but now it has expanded to embrace earlier periods. Indeed, another important recent milestone occurred at Baku in 2019 when the *8th Century Ancient Ferrous Metallurgy Sites of Burkina Faso* were inscribed by UNESCO to the World Heritage List (UNESCO, 2026a). A further important shift is that industrial heritage is now perceived to include heritage elements such as housing, places of worship and cultural sites associated with working communities. This is well demonstrated by the *Nord-Pas de Calais Mining Basin,* which was inscribed in 2012 (UNESCO, 2026b).

South-East Asia features certain industries that can only be found in the region, due to its unique cultural and environmental context and layered history brought about by early globalisation, colonisation and decolonisation processes. For example, the creation of hand-drawn Peranakan batik of Lasem Merah (red batik), is achieved through unique dyeing techniques representing the fusion of traditions of Chinese and Javanese culture integrated into textile designs (Heringa & Veldhuisen, 1996). The earthenware pottery from Baan Maw, Mahasarakham Province in Thailand by the Thai-Khorat people is a variant of Khmer earthenware production. This pottery primarily depends on the skill and expertise of women where men only assist in mining, processing, and kneading raw clay and temper (Lefferts & Court, 1999).

The industry of natural rubber prevalent in Malaysia, Thailand, Indonesia, and Viet Nam began with experimentation by Henry Nicholas Ridley in 1888 to 1905 with the commercial production of rubber tree *(Hevea brasiliensis)* from the

“South-East Asia features certain industries that can only be found in the region, due to its unique cultural and environmental context and layered history brought about by early globalisation, colonisation and decolonisation processes.

Singapore Botanic Gardens (Eaton, 1935). The distribution of enormous amounts of planting material spread throughout the Malayan peninsula and, eventually, in other parts of the region. The story of sugar production in the Philippines shows a complex legacy of economic growth of planting sugarcane *(Saccharum officinarum)* from sustainable minimal consumption of Indigenous Peoples before colonisation, it has transformed into a global industrial trade with feudal landholding and complex labour structures established in the 19th century. This continues to shape Philippine society and politics today (Tadem, 2005).

These are just snippets of narratives gathered by this report. Interwoven with these layers of history are the day-to-day impacts of climate change and the volatility of the society to global forces, including changing political agendas, the aftershocks of warfare, and the devastating effects of global pandemics, all of which continue to shape industries even to the present day.

Purpose of the Report

This report is an anthology of ideas, narratives and examples of industrial heritage in the region. It provides a glimpse of what are mostly hidden places and practices, often unappreciated and even by heritage scholars in the region. It highlights the current state of knowledge on industrial heritage and offers a range of interpretations of 'industrialisation', understood as a layered historical process shaped by early globalisation, colonisation, struggles for independence, and contemporary imperatives for Sustainable Development. These processes have had lasting impacts not only on industrial sites themselves, but also on the wider communities connected to them.

Researchers of this report have come together from various foci of study. Some were part of the network of contributors to the 2025 publication *mASEANa: Appreciating modern ASEAN architecture.* There were some ICOMOS specialists looking at urban development and heritage in South-East Asia, while others were recommended by National Commissions for UNESCO and the UNESCO Regional Offices in Bangkok and Jakarta. These contributors provided different approaches in seeing industrial heritage, stretching the discourse temporally – capturing pre-colonial, colonial and post-independence narratives; and also, typologically – further defining industrial heritage as lived experiences and practises, and sites of industry and memory. This report aspires to enhance levels of protection for industrial heritage as well as increase the recognition of the industrial communities whose labour, ingenuity and sacrifice plays a meaningful and decisive part in the evolution of these countries as we know them today.

Broadly, the project aims to do the following: (1) Identify and inventory significant industrial heritage sites across participating countries – from modern factories and transport systems to older manifestations of industry like extraction sites, ceramic production techniques and traditional textile manufacturing sites. (2) Assess conservation status and risks by analysing how these heritage places have been treated under existing heritage laws, urban plans and development projects. (3) Highlight policy and institutional frameworks, pinpointing national legislation and planning practices to understand gaps or strengths in protecting this industrial legacy. (4) Build capacity and awareness by engaging stakeholders such as government agencies and local heritage practitioners through regional workshops and online consultative meetings.

Methodology

Over the past year, we supported the UNESCO Regional Office in Bangkok and collaborated with two institutional partners – The International Committee for the Conservation of Industrial Heritage (TICCIH) and the ICOMOS International Scientific Committee on Twentieth Century Heritage (ISC20C) and implemented a work plan for this study. We began in March 2025 and reached out to National Commissions for UNESCO and UNESCO Regional Offices to identify potential collaborators familiar with sites and practices of industries within their countries and the region to act as national writers.

On 5 May 2025, an online kick-off meeting gathered the national writers to formally launch the project, establish consensus on the type of information to be collected, and to define the final outputs of the initiative. Four well-versed and high-level heritage experts and scholars were invited to act as provocateurs, presenting baseline principles and illustrating case studies and previous initiatives to spark new ideas about what it means to have a regional study of industrial heritage. UNESCO Bangkok organised an online regional discussion on 9 July 2025 to get a glimpse of the development of ideas from eight countries who participated in the research. Unfortunately, there were no local inputs from three South-East Asian countries: Brunei Darussalam, Timor-Leste and Lao DPR. However, desktop research was done by the authors to provide basic information concerning the industrial heritage scene of these three countries. Data was collected for a period of nine months and by December 2025, final editing and graphic design commenced with the final completion of the project in March 2026.

Three types of collaborators provided inputs to this study: first are the provocateurs, scholars who helped define what industrial heritage is in the context of and from a South-East Asian perspective. They provided different ways of thinking about the industrial history of the region, which provided inspiration for the rest of the writers. Second are the national writers and researchers who wrote and compiled an illustrated and consolidated report for their country. They highlighted examples of significant industrial heritage sites in their home country and delivered a summary report providing a national perspective, as well as a longer list of potential sites and practices, allowing for further investigation and future study.

Lastly, peer reviewers were invited to verify information shared by the national writers. These reviewers helped verify the national narratives. We thank the colleagues from ISC20C and TICCIH and the UNESCO Regional Offices who provided factual verification to the information that was gathered in this report.

Limitations & Focus

As a report commissioned by the UNESCO Regional Office in Bangkok aiming to investigate the wide and unexplored topic of industrial heritage during a period of just one year, this research is only the first step of a longer-term investigation to better understand and recognise this heritage typology as it is present in the region. It requires more scholarship from practitioners and heritage scholars to map, register and safeguard important sites and practices that represent the industrial history of South-East Asia. We are also aware that there were countries that were not represented in depth in this report – Brunei Darussalam, Timor-Leste and Lao DPR, while other countries such as Viet Nam, Cambodia and Myanmar had challenges of investigation because of internal issues. This report does not therefore constitute a definitive inventory of industrial heritage, but

instead establishes a foundation for more comprehensive future work as awareness of industrial heritage starts to catch on and continues to develop.

It is important to emphasise that contributors from South-East Asia are actively expanding the conventional definition of industrial heritage beyond its tangible aspects. The study includes several examples not limited to specific sites, but also encompassing cultural practices unique to particular regions. These highlight the intangible dimensions of industry — technical expertise, social organisation, and cultural legacies — that have shaped communities. Notably, smaller cottage industries within local or Indigenous Peoples are identified and underscored for their role in preserving endangered trades and traditions. They reflect a specific processing or production of goods that represent a dying trade or cultural tradition. Provocateurs of this study have strongly advocated for a longer discourse on the social tensions, economic disparities, and political meanings of industrial heritage specific to South-East Asia. These places are not neutral spaces. They are often marked by contestation and power dynamics that need to be carefully discussed as part of defining their important meanings to society. Defining these sites and practices as heritage should not just be a celebration of significant industries of nations, they should be thought of as holistic recognition of the contribution of people, both the labourer and the industrialist, in creating new products for the world to use.

We extend our gratitude to UNESCO Bangkok for supporting this thematic regional study, which has illuminated a critical knowledge gap requiring further exploration. The involvement of TICCIH and ISC20C has been invaluable, providing essential insights that underpin this report. Colleagues came together to open new chapters of discourse. National contributors have worked tirelessly to represent their country's industries, showcasing various typologies of heritage, and provocateurs have shared great insights that will surely ignite new research ideas in the future.

References:

Eaton, B. J. (1935). "Mr. Ridley and Rubber in Malaya". Singapore Botanic Gardens Garden Bulletin, 4(4), 39-41.

Hayashi, K., Muramatsu, S., Yamana, Y. & Widodo, J. (2024). mASEANa: Appreciating modern ASEAN architecture. Tokyo, Japan: Docomomo Japan.

Heringa, R. & Veldhuisen, H. C. (1996). Fabric of Enchantment. Batik from the North Coast of Java. Los Angeles: Los Angeles County Museum of Art. ICOMOS, and TICCIH (2011). "Joint ICOMOS-

TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes." Adopted by the 17th ICOMOS General Assembly, 28 Nov. 2011. The Dublin Principles. Paris.

Lefferts, L. & Cort, L. A. (1999). "Women at the Centre of an Industrializing Craft: Earthenware Pottery Production in Northeast Thailand". Museum Anthropology, 23(1), 21-32.

mAAN Seoul Declaration 2011 on Industrial Heritage in Asia. International Conference on "Our Living Heritage: Industrial Buildings and Sites of Asia," Seoul, 25-27 August 2011.

Tadem, E. C. (2005). "The Political Economy of Sugar: Industry Policy and Crony Capitalism in the Philippines." Philippine Political Science Journal, 26(49), 123–150.

UNESCO (2026). Ombilin Coal Mining Heritage of Sawahlunto. Available at: https://whc.unesco.org/en/list/1610/ (Accessed: 8 March 2026).

UNESCO (2026a). Ancient Ferrous Metallurgy Sites of Burkina Faso. Available at: https://whc.unesco.org/en/list/1602/ (Accessed: 10 March 2026).

UNESCO (2026b). Nord-Pas de Calais Mining Basin. Available at: https://whc.unesco.org/en/list/1360/ (Accessed: 12 March 2026).

3

Defining Industrial Heritage

Defining Industrial Heritage



Miles Oglethorpe
The International Committee for the Conservation of the Industrial Heritage (TICCIH)

President of TICCIH between 2018 and 2025, and Board member since 2003. Retired from the national heritage organisation, Historic Scotland in 2024 after 39 years' service. Graduated with PhD at Glasgow University, commencing work on industrial heritage as a research fellow at Strathclyde University in 1983. Led the team that successfully nominated The Forth Bridge for World Heritage listing in 2015, and continues to work with international partners on industrial heritage in Japan, Norway, Poland and the Middle East. Specialised in the history of coal mining and also helped found the project 'Capturing the Energy' in 2005, which works to secure the history of the United Kingdom of Great Britain and Northern Ireland's offshore oil and gas industries. Continues to work on World Heritage issues, and advises ICOMOS. Teaches for the postgraduate conservation course at the University of Edinburgh.

Introduction: The Origins of Industrial Heritage

This chapter aims to offer a definition of industrial heritage and provides a brief background to the evolution of the subject, which is unavoidably Eurocentric. It then begins the process of placing it in a South-East Asian context, a task which is carried forward in much more detail by the next chapter of essays, which set the scene and provide vital regional texture and context.

'Industrial Heritage', or 'Industrial Archaeology' as it was more usually known in its evolutionary years, is not new, but its importance has only been widely recognised since its emergence in the latter half of the 20th century. However, one of the earliest instances of industrial heritage being recognised as a potential category of archaeology was by Viterbo Sousa, writing in the journal, *O Archeologo Portugues* in 1896 (Sousa, 1896).

Published by the Portuguese Ethnographic Museum in Lisbon, his paper explicitly used the term 'Archaeologia Industrial', in particular citing the importance of wind and water mills in Portugal. He asked why there should not be an archaeology of industry, observing the severe threat to many historic industrial sites. He then passionately advocated for the establishment of survey and inventory programmes.

Thereafter, there seems to be little published evidence of industrial archaeology gaining traction until the 1950s when it began to emerge as a coherent, active field of study, notably in the United Kingdom of Great Britain and Northern Ireland (UK). This is generally attributed to the publication by Michael Rix in 1955 of a paper in The Amateur Historian entitled 'Industrial Archaeology'. Rix (1955) observed that no significant attention or consideration had yet been given to the subject, except perhaps indirectly via the activities and journal of the Newcomen Society. Not long afterwards, the need to address this situation was brought into sharp focus by growing threats to often iconic monuments and infrastructure, such as the Euston Arch and its associated railway terminus in London, which were demolished amid outcry in 1961 to 1962. During the ensuing years and decades, the UK witnessed an increased public interest in industrial heritage, and campaigns developed to save endangered sites. This was a period of mass volunteering, demonstrating in particular the popularity of canals and railways across the country, and the importance of industrial heritage to local communities.

Despite widespread destruction, by the early 1970s, many iconic industrial sites had been rescued by the actions of grass-roots activists, led by pioneers like Tom Rolt. Site data was compiled via the Council for British Archaeology (CBA) and inventories were published by prime movers like Neil Cossons in England and John R Hume in Scotland. Also of critical importance was the formation of the Association for Industrial Archaeology (the AIA) in 1973, which brought together people and local societies under the umbrella of a single national network. British national heritage bodies began to employ industrial heritage specialists, and very significantly, statutory protection (in the form of listing, scheduling and conservation area designations) was extended to include industrial heritage.



Figure 1: Railway heritage is one of the most popular forms of industrial heritage across the world, not least in South-East Asia. The Long Bien railway bridge in Hanoi across the Red River in Việt Nam (completed in 1902) is a fine example. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO

Outside the UK, notably in Western Europe and North America, similar movements were evolving and industrial heritage was gaining traction and winning protection in the wider heritage world. This culminated in the mid-1970s with the establishment of The International Committee for the Conservation of the Industrial Heritage (TICCIH). The process commenced in 1973 at a meeting hosted in England's Ironbridge Gorge, followed by meetings in Bochum, Germany, and then Stockholm in Sweden, by which time TICCIH had formally emerged as an international organisation. It was more than appropriate, therefore, that TICCIH celebrated its 50th Anniversary during its 2025 congress in Kiruna, Sweden.

Unsurprisingly, the early years of TICCIH were heavily focused on Europe and North America, not least because this is where the 'Industrial Revolution' was perceived to have originated. Equally, many countries in these regions were undergoing rapid and traumatic deindustrialisation, so there was an urgent need to address immediate existential threats to industrial heritage, sometimes on an enormous scale. In time, however, the network expanded across the world, notably into Latin America, Japan, India and China. In the 1990s, Eastern Europe also began to emerge in the aftermath of the disintegration of the Soviet bloc. However, there remained several relatively inactive and under-represented parts of the world, not least South-East Asia.

So, What is Industrial Heritage?

The geographical origins of industrial heritage as we know it today, and the often titanic challenges faced by its conservation pioneers, inevitably shaped early definitions of its nature and scope. As will be explored in more depth in Chapter 5, this has tended to result in an Anglocentric and Eurocentric focus as well as narrow definitions confined to the period of the Industrial Revolution and 18th to 20th Centuries. This situation is reflected in the *Nizhny Tagil Charter of 2003,* which was the first major attempt at an international level to define Industrial Heritage and was a major step forward. Eight years later, The *mAAN Seoul Declaration 2011* helped widen its scope to address the broader, sometimes negative impacts of historic industrial activity. In the same year, ICOMOS and TICCIH jointly developed the *Dublin Principles,* which were ratified in 2011. These doctrinal texts are part of the starting point of ideas to dissect the meaning of industrial heritage in South-East Asia written by Johannes Widodo, Ivan Henares and Richard Engelhardt in their essays in the subsequent chapters.

> **"Industrial heritage reflects the profound, sometimes negative connection between the cultural and natural environment, as industrial processes – whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets. It includes both tangible material assets – immovable and movable –, and intangible dimensions such as technical know how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities**

In summary, the *Dublin Principles* state that Industrial Heritage is considered to consist of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their



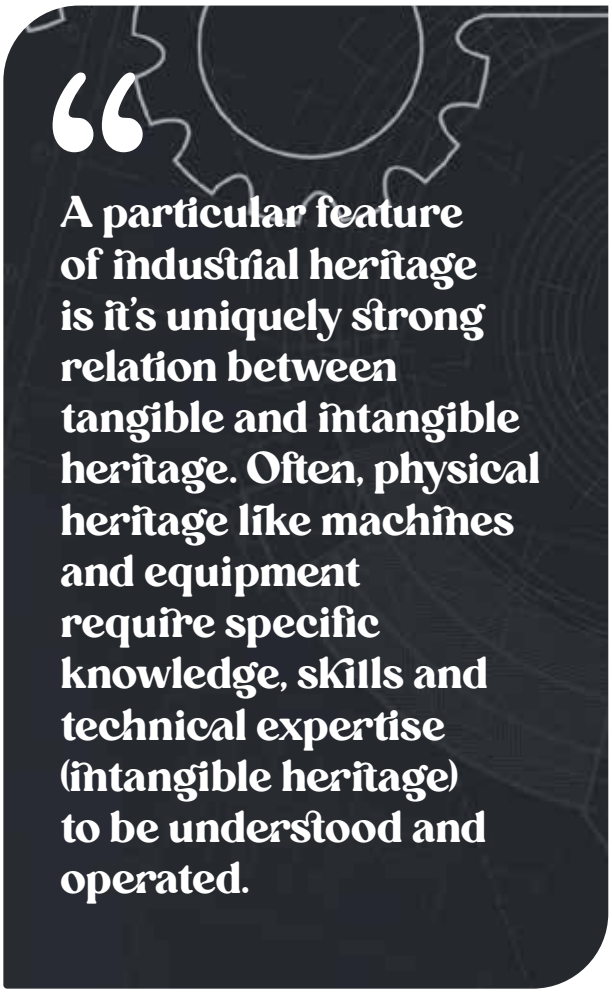
Figure 2: The *Dublin Principles* expanded the accepted definition of industrial heritage to include buildings and structures produced by or associated with industrial activity and industrial communities. An example is Lau Pa Sat (also known as Telok Ayer) Market in Singapore, a cast-iron structure which dates from the colonial era and was built by Walter Macfarlane of Glasgow in 1892. Photograph by Miles Oglethorpe (2017). CC-BY-SA 3.0 IGO

transformation into goods, and the related energy and transport infrastructures. Industrial heritage reflects the profound, sometimes negative connection between the cultural and natural environment, as industrial processes – whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets. It includes both tangible material assets – immovable and movable –, and intangible dimensions such as technical know how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities (Figure 2) and brought major organisational changes to entire societies and the world in general.

To date, The *Dublin Principles* remains the most useful and widely accepted definition of Industrial Heritage. However, the new Board of TICCIH is currently in the process of updating the *Nizhny Tagil Charter,* further taking into account the changes that have occurred since 2003, including *the mAAN Seoul Declaration 2011,* and initiatives like the Taipei Declaration in 2012. In the process, TICCIH should be able to take on board the findings from this study of South-East Asia.

What makes Industrial Heritage so special?

At this stage, it is useful to explore what makes industrial heritage stand out from other branches of heritage categories because this ultimately influences how it is managed and may help inform the situation in South-East Asia. First, it can be seen as technically complex and sometimes this is a disincentive when its future is being considered, especially by people who do not understand it. This highlights a particular feature of industrial heritage, which is the uniquely strong relation between tangible and intangible heritage. Often, physical heritage like



machines and equipment require specific knowledge, skills and technical expertise (intangible heritage) to be understood and operated. In these circumstances, the survival of the tangible heritage is significantly devalued if the intangible does not survive, and vice versa. Ensuring the inter-generational transfer of the intangible heritage is also a major priority for industrial heritage in many countries.
A second attribute of industrial heritage is that it is dynamic, like the industries from which it is derived, which would have changed constantly as the technologies, processes and markets on which it was based evolved. Sometimes, selecting a representative period within an industrial site’s timeline can be difficult. Equally, industrial heritage sites often continue to evolve after the founding industries on which they are based have ceased to operate, and the future of such sites sometimes depends on a flexible approach if they are to survive.

One of the most obvious features of industrial sites is their potential scale. While there are many examples of small or modest-sized sites, such as water and windmills, industrial heritage can manifest itself as huge complexes like integrated iron and steel works, mines or as entire landscapes. In the past, this was a common reason that was cited for the abandonment and destruction of important sites, but in recent years there have been ambitious projects that have proved the impossible to be possible, not least in Germany and in Czechia.

One of the biggest challenges facing industrial heritage is that it often brings with it a toxic legacy. This can range from the contamination of sites to the poisoning of entire landscapes. Once again, this was once perceived to be an insurmountable problem, but in recent decades there have been many successful rehabilitation projects. A major point is that some contamination is obvious and easily treatable while in other situations, it is invisible but still very harmful. A good example is asbestos which, if found at a site, can cause panic unless a properly qualified person is available to assess the situation and evaluate the hazards in a balanced, informed way.

Often, one of the most distinctive facets of industrial heritage is its strong link to communities, many of whom have been afflicted by traumatic de-industrialisation, and/or abuse and exploitation. Working conditions in some industries were notoriously poor, resulting poor health and low life expectancy. The impact on industrial communities was often enormous, especially where there was conscripted, forced or slave labour, and especially in times of war. This highlights the fact that some industries were more prone to abuse and exploitation than others. Equally, some industrialists were relatively enlightened, which is why there are a few company towns and villages on the World Heritage List, such as *New Lanark* (inscribed in 2001).

Nevertheless, industrial heritage covers some dark and controversial sectors of activity, not least those associated with warfare such as munitions, but also more complicated sectors such as nuclear, which straddles the boundary between civilian and military activity. This in turn emphasises the political sensitivities and strategic nature of some industries. However, even mainstream industries such as textiles have historically had negative impacts on the environment in which they are situated, not least damage to rivers and wider ecosystems. This in turn raises the obvious point that exponential industrialisation has been and remains a major force driving climate change.

Another unusual feature of industrial heritage is that it is sometimes operational and is performing the same functions for which it was originally built (Figure 3). This is most often encountered in relation to infrastructure such as water supply, hydro-power systems, railways, canals and roads. In these circumstances, there is frequently a major opportunity to forge links with local communities and to keep alive intangible heritage that might otherwise be lost. A good example is railway heritage, which often involves keeping alive locomotives and machines as well as the infrastructure on which they operate. Indeed, some countries in South-East Asia are home to very active railway heritage groups.

> **“Industrial heritage is dynamic, like the industries from which it is derived, which would have changed constantly as the technologies, processes and markets on which it was based evolved.**



Figure 3: The Long Bien railway bridge over the Red River in Hanoi, built by French engineers in 1902, and despite US bombardment during the Viet Nam War, is still in operation. Photograph by Miles Oglethorpe (2018).
CC-BY-SA 3.0 IGO

In these circumstances, and for industrial heritage more generally, its educational significance can be of immense value. For example, it is especially well placed to assist the teaching of science, technology, engineering and maths (STEM) subjects in schools and colleges. There is also the potential to connect emerging generations with their material past more effectively and highlight all the dependencies that sit behind them and support their daily lives. Many industrial heritage sites already have well-established education programmes, sometimes tied into national curricula.

A particularly important feature of industrial heritage is that it is truly interdisciplinary and is spread across the heritage sector and beyond. In addition to the sites themselves, it can be found within the collections of museums, galleries and archives, and brings together a wide range of specialists, ranging from architects, engineers and archaeologists to academics, planners and politicians. As such, these diverse groups can work together to add to its cultural value, enhancing community identity and augmenting associated education. This suggests that industrial heritage is particularly well placed to align with and support the UN's Sustainable Development Goals (SDGs), and even more so when it is transnational in nature.

In fact, and finally, perhaps the most striking feature of industrial heritage is its international dimension. Industrial activities in their earliest phases tended to be local, sometimes expanding to a regional scale. However, from the 19th century on, the industrialisation process became increasingly global. In South-East Asia, for example, this is reflected in the colonisation of most countries in the region by the UK, France, Kingdom of the Netherlands, Portugal, Spain, and the United States of America. This complex



Figure 4: Colonial era industrial heritage: Cavanagh Bridge, Singapore, built by Scottish engineers, P&W Maclellan, in 1868. Photograph by Miles Oglethorpe (2017). CC-BY-SA 3.0 IGO

legacy has added to the rich range of industrial heritage in the region. This study contains national narratives which will further expound on these international dimensions and the linkages with the implementation of the SDGs.

Industrial Heritage on UNESCO's World Heritage List by 2025

With this international dimension in mind, it is useful to consider what industrial heritage already features on UNESCO's World Heritage List. In doing so, it is clear that many of the special attributes of industrial heritage have emerged as the List has evolved (see the chronological table below). There were very few early inscriptions of industrial heritage sites, but the first was the *Wieliczka and Bochnia Royal Salt Mines* near Krakow in Poland, which was inscribed in 1978 during the first proper session of the World Heritage Committee. This is an astonishing property with impressive clusters of surface buildings sitting above an enormous network of mineworkings and excavated chambers into which millions of visitors are welcomed throughout the year.
The second property to be successfully nominated was the *17th-century Roros Mining Town* and its associated landscape in Norway, which was inscribed in 1980 and was associated with copper extraction. It was followed by the *Ironbridge Gorge* in England in 1986, a property which is associated with Abraham Darby and the birth of the coke-based modern iron industry in 1708. There followed a trickle of inscriptions, and a wide variety of properties. The potential enormous scale of industrial heritage was demonstrated by *Voklingen Ironworks* in Germany, inscribed in 1994. Two years later, *Crespi d'Adda* in Italy was the first company town to be listed, and was part of a surge in industrial nominations, with four being successful in 1996. Among them was the first operational site, *The Canal du Midi* in France.

1996 represented an important change of pace, and industrial nominations became more regular as the 21st Century dawned. New properties on the World Heritage List included railways, wind and water mills, pumping stations, coal mines and industrial landscapes. The increase in nominations was also caused by some countries, notably the UK, recognising the importance of their historic industries and deliberately weighting the content of their Tentative List. As a consequence, half the sites on the 1999 British Tentative List were industrial, and this is reflected in a sequence of successful nominations in the early years of the new century. This is also the reason why the country still has the largest number of industrial properties on the World Heritage List.



Figure 5: The Forth Bridge, Scotland, which was inscribed by UNESCO in 2015. Completed in 1890, it has 2.5km of Burmese teak hand rail on each side of the railway track, a feature which is mentioned in Westofen's epic description of the building of the bridge, published in 1890. Photograph by Miles Oglethorpe (2012).
CC-BY-SA 3.0 IGO

Other trends to note include the successful nomination of wine regions, and the inclusion of some especially 'difficult' heritage. Good examples include the *Zollverein Coal Mine Industrial Complex* in Germany (2001), the history of which includes conscripted and slave labour associated with the Nazi era. Another complex and well interpreted nomination was a rare example of a serial nomination, which was the *Heritage of Mercury sites of Idrija* (Slovenia) and *Almadén* (Spain), inscribed in 2012. The heritage of mercury is especially dark both because of terrible working conditions and the very low life-expectancy of those who mined and processed the ore, and also because of the environmental devastation it caused, not least in the goldfields of the New World. However, mercury had many positive uses, so the narrative is more complicated than it might first seem.

Meanwhile, three years later, 2015 witnessed another surge in nominations. An important point to note is that up until this time, only seven (17%) out of the 41 nominations of industrial heritage sites had been from outside Europe. So, the nominations from Uruguay, Mexico and Japan were especially welcome to enhance the diversity of this heritage category on the World Heritage List. However, the enormous geographical gaps in the List were glaringly obvious, not least in Africa and South-East Asia. In amongst the 2015 batch of nominations was *The Forth Bridge* in Scotland, which is an enormous piece of operational infrastructure carrying over 200 trains a day. One of its more unusual features is approximately 2.5 kilometres of substantial, original wooden handrail on both sides of the railway tracks which are made from Burmese Teak. These remain in excellent condition 135 years after the bridge was constructed (Figure 5).

The 2019 session of the World Heritage Committee in Baku, Azerbaijan, deliberated one of the largest batches of industrial heritage nominations in a single year. In amongst the six properties presented was a serial nomination, the



Figure 6: The moment in Baku, Azerbaijan, at the 48th Session of the World Heritage Committee in July 2019 when the Ombilin Mining Heritage of Sawahlunto was inscribed by UNESCO. Photograph by Miles Oglethorpe (2012). CC-BY-SA 3.0 IGO

Erzgebirge/Krušnohorí Mining Region (which straddles the border between Czechia and Germany and the Ore Mountains Region) was successfully inscribed to the World Heritage List. It is an immensely important historic mining region and the nomination was ambitious and immensely challenging. One of the many reasons for this is that, in addition to its 14th-century silver mines, it incorporated nuclear heritage related to uranium mining in the 20th century, together with very difficult sites like *The Red Tower of Death.* This was a post-World War II concentration camp for political prisoners who were forced by their captors to hand-process uranium ores without protection to assist the development of Soviet atomic weapons.

The inscription of the *Erzgebirge/Krušnohorí Mining Region* was a triumph and demonstrates what is possible with the support of national and regional authorities. It also carried a resonance because of its healing properties in the regional context of post-war tensions between the communities on each side of the German/Czech Border, some of which had been torn apart by forced migrations and expulsions at the end of the war.

However, perhaps the most striking feature of the session was the inscription of South-East Asia's first industrial World Heritage site, the *Ombilin Coal Mining Heritage of Sawahlunto* in Indonesia (Figure 6). This is a milestone inscription, and our hope is that this new appreciation of industrial heritage and, together with this study for South-East Asia, will help provide a foundation from which more nominations in the region can follow.

Another milestone to occur in the 2019 session in Baku was the inscription of Africa's first industrial World Heritage site, *The Ancient Ferrous Metallurgy Sites of Burkina Faso*. This is doubly significant because it cements the recognition that 'pre-industrial' sites are of immense importance and should be considered as a mainstream part of industrial heritage representation in the World Heritage List. The property includes over a dozen standing, natural-draught furnaces and associated smelting structures, mines and traces of settlements dating back to the 8th century BCE.

Since 2019, there have been two non-European inscriptions, one in the Islamic Republic of Iran and one in Japan. Of the 1,248 properties on the World Heritage List, 65 (5%) can be classed as industrial heritage. Among these, only 15 (23%) are outside Europe, and only one is in South-East Asia. An interesting feature of the list is that Japan now has four industrial World Heritage sites, a fact which reflects that it was one of the few countries outside Europe to embrace industrial heritage in its early years.

Chronology of Industrial UNESCO World Heritage Listings, 2025

Name of Property	Country	Date
Wieliczka and Bochnia Royal Salt Mines	Poland	1978
Røros Mining Town and the Circumference	Norway	1980
Ironbridge Gorge	UK	1986
18th-Century Royal Palace at Caserta with the Park, the Aqueduct of Vanvitelli, and the San Leucio Complex (silk mill)	Italy	1987
Historic Town of Banská Štiavnica and the Technical Monuments in its Vicinity	Slovakia	1993
Engelsberg Ironworks	Sweden	1993

Chronology of Industrial UNESCO World Heritage Listings, 2025		
Name of Property	Country	Date
Völklingen Ironworks	Germany	1994
Crespi d'Adda	Italy	1996
Verla Groundwood and Board Mill	Finland	1996
Canal du Midi	France	1996
Historic Centre of Oporto, Luiz I Bridge and Monastery of Serra do Pilar	Portugal	1996
Mill Network at Kinderdijk-Elshout	Netherlands	1997
Semmering Railway	Austria	1998
Ir.D.F. Woudagemaal (D.F. Wouda Steam Pumping Station)	Netherlands	1998
The Four Lifts on the Canal du Centre and their Environs, La Louvière and Le Roeulx (Hainaut)	Belgium	1998
Mountain Railways of India	India	1999
Blaenavon Industrial Landscape	UK	2000
Zollverein Coal Mine Industrial Complex in Essen	Germany	2001
Mining Area of the Great Copper Mountain in Falun	Sweden	2001
Derwent Valley Mills	UK	2001
Saltaire	UK	2001
New Lanark	UK	2001
Alto Douro Wine Region	Portugal	2001
Tokaj Wine Region Historic Cultural Landscape	Hungary	2002
Grimeton Radio Station, Varberg	Sweden	2004
Liverpool – Maritime Mercantile City *(delisted 2021)*	UK	2004
Chhatrapati Shivaji Terminus (formerly Victoria Terminus)	India	2004
Humberstone and Santa Laura Saltpeter Works	Chile	2005
Alto Douro Wine Region	Portugal	2001
Tokaj Wine Region Historic Cultural Landscape	Hungary	2002
Grimeton Radio Station, Varberg	Sweden	2004
Vizcaya Bridge	Spain	2006
Sewell Mining Town	Chile	2006
Cornwall and West Devon Mining Landscape	UK	2006
Rideau Canal	Canada	2007
Iwami Ginzan Silver Mine and its Cultural Landscape	Japan	2007
Rhaetian Railway in the Albula / Bernina Landscapes	Switzerland/Italy	2008
Pontcysyllte Aqueduct and Canal	UK	2009
Nord-Pas de Calais Mining Basin	France	2012
Major Mining Sites of Wallonia	Belgium	2012
Heritage of Mercury. Almadén and Idrija	Slovenia/Spain	2012
Tomioka Silk Mill and Related Sites	Japan	2014

Chronology of Industrial UNESCO World Heritage Listings, 2025		
Name of Property	Country	Date
Fagus Factory in Alfeld	Germany	2014
The Grand Canal	China	2014
Van Nellefabriek	Netherlands	2014
The Forth Bridge	UK	2015
Aqueduct of Padre Tembleque Hydraulic System	Mexico	2015
Fray Bentos Industrial Landscape	Uruguay	2015
Sites of Japan's Meiji Industrial Revolution	Japan	2015
Rjukan-Notodden Industrial Heritage Site	Norway	2015
Speicherstadt and Kontorhaus District with Chilehaus	Germany	2015
The Climats, terroirs of Burgundy	France	2015
Champagne Hillsides, Houses and Cellars	France	2015
The Persian Qanat	Iran	2016
Tarnowskie Góry Lead-Silver-Zinc Mine and its Underground Water Management System	Poland	2017
Ivrea, industrial city of the 20th century	Italy	2018
Krzemionki Prehistoric Striped Flint Mining Region	Poland	2019
Erzgebirge/Krušnohoří Mining Region	Germany/Czechia	2019
Water Management System of Augsburg	Germany	2019
Jodrell Bank Observatory	UK	2019
Ombilin Coal Mining Heritage of Sawahlunto	Indonesia	2019
Ancient Ferrous Metallurgy Sites of Burkina Faso	Burkina Faso	2019
The Slate Landscape of Northwest Wales	UK	2021
Trans-Iranian Railway	Iran (Islamic Republic of)	2021
Cordouan Lighthouse	France	2021
Roșia Montană Mining Landscape	Romania	2021
Žatec and the Landscape of Saaz Hops	Czechia	2023
Sado Island Gold Mines	Japan	2024
Total: 65 (out of 1,248 – 5.2%)		
Source: UNESCO, https://whc.unesco.org/en/list/		

Conclusion: Implications for South-East Asia

Today, South-East Asia is well known for being home to a wide variety of industries, and can boast one of the original 'Tiger Economies' (Singapore) as well as four 'Tiger Cub' economies (Thailand, Malaysia, Indonesia and Viet Nam). There is therefore an established mix of industrial activity which includes energy (petroleum, natural gas, coal, hydro-power), minerals (tin, iron ore, manganese, copper, tungsten and more), stone (including gem stones), and forest industries (timber, rubber, charcoal, camphor, cutch). Processing and manufacturing industries include metallurgy (tin, iron, steel, aluminium), engineering, shipbuilding, vehicle manufacture, textiles, chemicals, ceramics, paper, cement, glass and electronics. Also important are agricultural and fishing industries (such as sugar, rice, coffee, tea, fish), and at a smaller scale, there

are significant craft industries. Many of these activities are supported by transport infrastructure such as railways, roads, ports and harbours.

The roots of this industrial activity stretch back over many centuries to pre-colonial times. There is no doubt, therefore, that there is a lot of significant industrial heritage in South-East Asia, much of which has yet to be recognised. A significant proportion of this heritage dates from the colonial period, in particular the pre- and post-war decades of the 20th century. For this reason, *the Twentieth-Century Historic Thematic Framework* (HTF), developed by the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C) and The Getty Conservation Institute, is an especially powerful tool when analysing South-East Asia's industrial heritage (see Chapter 5).

Meanwhile, the signing of the *Taipei Declaration of 2012* was a major step forward, as was the establishment of the Asian Network of Industrial Heritage six years later in 2018. However, the inscription of *Ombilin Coal Mining Heritage of Sawahlunto* onto the UNESCO World Heritage List in 2019 is perhaps the most potent symbol of progress, and the hope is that it represents the beginning of an era in which industrial heritage will be mainstreamed within the wider cultural mix of South-East Asian heritage.

In conclusion, it is worth noting that in 1992, the extraordinary Blackwell Encyclopedia of Industrial Archaeology was published in the UK and the USA. It is almost 1,000 pages long and is international in scope. However, at the time it was compiled, South-East Asia barely registered on the global scene and does not feature significantly in the book. Our ambition is that, if and when the report is revised and re-published, this gap of knowledge can be rectified. In 1896, Sousa Viterbo observed the need for the recognition of industrial archaeology and for the identification and protection of important sites in Portugal. Today, the same situation prevails across South-East Asia, and our hope is that this project will help launch a voyage of discovery that will ultimately bring benefits across the region.

References:

Cossons, N., 1975, The BP Book of Industrial Archaeology, David & Charles, Newton Abbot

Cossons, N., 2016, 'Why Preserve the Industrial Past', Industrial Archaeology Review, 38(1), pp. 5–18.

Douet, J (ed), 2012. Industrial Heritage Re-tooled: The TICCIH Guide to Industrial Heritage Conservation', Lancaster, Carnegie Publishing

Hume, J.R., 1976-7, The Industrial Archaeology of Scotland (2 vols – Lowlands and Highlands and Islands), Batsford, London.

ICOMOS-TICCIH, 2011, The Dublin Principles: the Conservation of Industrial Heritage Sites – Joint ICOMOS Principles for Structures, Areas and Landscapes, Paris, ICOMOS. https://ticcih.org/about/about-ticcih/dublin-principles/

Rix, M., 1955, 'Industrial Archaeology', The Amateur Historian, 2 (8), pp. 225-229
TICCIH, 2003, The Nizhny Tagil Charter for the Industrial Heritage, TICCIH's 12th General Assembly, Nizhny Tagil. https://ticcih.org/about/charter/

TICCIH, 2012, The Taipei Declaration for Asian Industrial Heritage, TICCIH's 15th General Assembly, Taipei. (https://ticcih.org/about/charter/taipei-declaration-for-asian-industrial-heritage/).

Trinder, B., 1992, Blackwell Encyclopedia of Industrial Archaeology, Oxford, UK ; Cambridge, Mass., USA: Blackwell

Viterbo, S (1896), 'Archaeologia Industrial Portuguesa os Moinhos', O Archeologo Portugues, pp193-204, Museu Ethnographico Português, Lisboa

4

Essays Setting the Scene in South-East Asia

Industrial Heritage in South-East Asia: From Pre-Industrial Societies to Nation-Building



Ivan Anthony S. Henares
University of the Philippines Diliman

Ivan Anthony Henares, PhD is Secretary-General of the UNESCO National Commission of the Philippines, Commissioner of the National Commission for Culture and the Arts, and Associate Professor at the University of the Philippines Asian Institute of Tourism. At present, he is also President of the ICOMOS International Cultural Tourism Committee, Chairperson of the Southeast Asian Cultural Heritage Alliance, Chairperson of the Heritage Conservation Society, and National Representative of the Philippines at The International Committee for the Conservation of the Industrial Heritage. Dr. Henares received his PhD in Hospitality and Tourism Management and Graduate Certificate in Environmental Policy from Purdue University where he was a Fulbright-CHED scholar.

Context: Heritage under Threat

South-East Asia's industrial heritage largely stems from colonial-era infrastructure and industries (Njoh, 2024). These include plantations (Byerlee, 2014) such as rubber (Hagan & Wells, 2005), tea (Alatas & Wan Sulong, 2020), sugar (Galloway, 2005; Aguilar, 2017; Henares, 2022; Nawiyanto, Capili & Calvaryni, 2023), and palm (Robins, 2020) and coconut oil (Ventura, 2022; Ramenzoni, 2024), mining (Baillargeon, 2020), forestry (Njoh, 2024), railways (Cubeiro Rodríguez, 2023), factories, and maritime heritage including lighthouses (Noche & Cruz, 2005; Tagliacozzo, 2005) and port facilities (Cubeiro Rodríguez, 2023). Many industrial heritage sites in the region are at risk due to rapid urbanisation, land development pressures, and limited resources for preservation. Many industrial sites (i.e. Pasudeco and Bacolod-Murcia sugar mill complexes in the Philippines) have already been demolished to accommodate modern developments, leading to loss of historical fabric.

Defining Industrial Heritage: Beyond Colonialism

Each South-East Asian country has distinct industrial legacies influenced by their colonial histories (Owen, 2005; Njoh, 2024). As such, there have been sentiments suggesting that the push for industrial heritage protection in South-East Asia has been too focused on colonial industrial heritage. While a valid point, we must examine the definition of industrial heritage to understand why this is the case.



Figure 1: The Pampanga Sugar Development Company (Pasudeco) sugar central in San Fernando, Pampanga, Philippines in 2005. It was demolished in 2018 to make way for a new development of Megaworld Corporation. Structures of Bacolod-Murcia in Negros Occidental were also demolished for another Megaworld project. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

The *Nizhny Tagil Charter for the Industrial Heritage* (TICCIH, 2003) defines industrial heritage as the "remains of industrial culture which are of historical, technological, social, architectural or scientific value." While the historical focus is "from the beginning of the Industrial Revolution in the second half of the eighteenth century up to and including the present day," we also examine "its earlier pre-industrial and proto-industrial roots."

During the Industrial Revolution, almost all of South-East Asia was under colonial influence (Owen, 2005). Much of its industrial heritage is therefore manifestly colonial because industrialisation arrived through colonisation (Booth, 2007; Njoh, 2024), and not as a result of local industrial revolutions. So, why not investigate the pre-industrial and proto-industrial roots of South-East Asia as the charter definition suggests? The remains of pre-industrial heritage or proto-industrialisation can be scarce because the materials used to construct many vernacular facilities were mostly organic matter which, combined with the lack of resources for more archaeological investigation, results in there being little visible physical evidence.

Before colonisation, South-East Asia's economies were largely based on agriculture (Yokokura, 1992), craft production (Junker, 1994), and maritime trade (Junker, 1990; Hall, 1996; Lim, Orillaneda, & King, 2021). Sophisticated systems of irrigation (Barker & Molle, 2004; Yekti, Schultz, Norken, Gany, & Hayde, 2017), shipbuilding (McCarthy, 1995; Valdez-Bubnov, 2020), weaving (Hall, 1996), and metallurgy (Loofs-Wissowa, 1983) were highly developed but did not involve large-scale mechanized production, the defining feature of modern industrial heritage. So, while there was ingenuity and infrastructure, it was not 'industrial heritage' in the modern sense. Hence, this explains the inclination towards colonial industrial heritage in South-East Asia by default.

> The remains of pre-industrial heritage or proto-industrialisation can be scarce because the materials used to construct many vernacular facilities were mostly organic matter which, combined with the lack of resources for more archaeological investigation, results in there being little visible physical evidence.

Key aspects of South-East Asian Industries

The Joint ICOMOS-TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes (2011) or *Dublin Principles* give a broader definition of industrial heritage – sites, objects, or documents that "provide evidence of past or ongoing industrial processes" which are either "ancient or modern." Aside from material assets, it includes "intangible dimensions such as technical know how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities and brought major organisational changes to entire societies and the world in general."

As we look at the industrialisation of products or industries endemic to South-East Asia, we note that their recognition as heritage today leans toward intangible heritage (Ignacio, Calaca, Leyson, & Tejero, 2000; Yankowski, 2019) rather than the built historical remnants of these industries. Community industrial heritage



Figure 2: A blacksmith (*panday*) in Kawit, Cavite, Philippines.
Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

in the region is often experienced more as intangible heritage than as preserved physical structures because South-East Asian societies tend to place high value on oral history, community memory, and intergenerational transmission of knowledge (Lim, Morrison & Kwa, 2000; Van Engelenhoven, 2024).

The Seoul Declaration on Industrial Heritage in Asia (modern Asian Architectural Network, 2011) states that "industry in Asia, unlike many parts of the post-industrialised West, is still alive and very much a part of our physical and cultural landscape today." It adds that it "seeks to expand our understanding of industrial heritage in Asia to include traditional industries that remain living and vital to our culture and not restrict it solely to heritage associated with development paradigms rooted in the industrial revolution in the West."

As such, indigenous technologies have not been generally defined as 'industrial' such as local traditions of metalworking (Loofs-Wissowa, 1983; Ignacio, et al., 2000), water management (Barker & Molle, 2004; Yekti, et al., 2017), and textile production (Hall, 1996). While technologically complex, they were usually classified as craft, agricultural, or intangible heritage rather than industrial. It goes without saying that the definition of 'industrial heritage' is Eurocentric, often excluding small-scale, decentralized, or non-mechanized systems, even if they were sophisticated.

These points are affirmed by the *Taipei Declaration for Asian Industrial Heritage* (TICCIH, 2012) which recognises "that industrial development in Asia is different from its counterparts in the West" and that "the definition of industrial heritage in Asia should be broadened to include technologies, machinery and producing facilities, built structures and built environment of pre-industrial revolution and post-industrial revolution periods." The *Taipei Declaration* also recognises that "industrial heritage in Asia is strongly related to local people" and that "the participation and engagement of the local people should be encouraged in the conservation of every industrial heritage site."

This South-East Asian initiative is a push towards redefining or reframing industrial heritage.



Figure 3: Elements of the subak water management system at Central Jatiluwih in Bali, Indonesia. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Nation-Building Between the Local Experience and the Official Narrative

As we discuss colonial industrial history, we acknowledge that it is an essential part of history, especially in regions like South-East Asia, where colonialism had a profound and lasting impact (Owen, 2005). Colonialism left a visible mark on industrial architecture and urban planning. These are now part of national and local heritage, even when they are painful reminders of foreign rule. What is important is that we recognise the achievements and contributions of industrial heritage without whitewashing the negative aspects such as indentured labour, corvée (Owen, 2005) and other forms of exploitation, contamination, and environmental impact (Njoh, 2024).

Industrial heritage is controversial for many interrelated reasons, reflecting deeper social, political, and cultural tensions. Industrial sites, especially in regions like South-East Asia, were developed during colonial rule, often through forced labour or direct coercion (Owen, 2005), displacement, land tenure (Njoh, 2024), and resource extraction that primarily benefited the colonisers or the landed elite. As we create inventories of industrial heritage in South-East Asia, while we celebrate the advancement of technology, we must also highlight the social costs and contentious scalar relations (Rhodes & Hannum, 2024) as lessons for the future, even providing chances for reflection upon colonialism (Sham, 2015).

Preserving industrial heritage in South-East Asia is important, even if it is complex or controversial because we are retelling a critical chapter of South-East Asian history. Industrial heritage documents how the region modernized, from colonial economies, early local industries, and post-independence nation-building. It tells the story of how people lived, worked, produced, and were exploited, and offers insight into technological change, labour struggles (Owen, 2005), and economic shifts, not often recorded in official narratives. Without it, we risk losing the material evidence of how modern South-East Asia was shaped.

While many industrial heritage narratives in former colonies focus on elites or colonial rulers, industrial heritage is where the working class, women, and migrants left their mark. Workers in plantations, mines, factories, railways, and ports and maritime facilities made vital contributions to the region's development but are sadly written out of the narratives and histories. Preserving these sites acknowledges their dignity, memory, and role in national and regional narratives. This is about social justice and inclusion as much as architecture. Sham (2015) notes that some countries have even "appropriated and transformed the former colonisers' heritage into their own narratives of the nation and on-going development."

> **"Community industrial heritage in the region is often experienced more as intangible heritage than as preserved physical structures because South-East Asian societies tend to place high value on oral history, community memory, and intergenerational transmission of knowledge**



Figure 4: Sulawesi schooners (pinisi) at Sunda Kelapa, the old port of Jakarta, Indonesia. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

On the Relevance and Use of Thematic Inventories

Creating a South-East Asian inventory of industrial heritage is important because it addresses deep gaps in historical knowledge, cultural identity, and sustainable development across the region. At the same time, South-East Asia shares many overlapping industrial histories such as rice production, fisheries and its products and by-products, tin mining in Malaysia, Indonesia, and Thailand; cane sugar production in the Philippines and Indonesia; railways in Viet Nam, Myanmar, and Thailand; and oil and gas in Brunei Darussalam, Indonesia, and Malaysia. A regional inventory allows for comparative analysis, cross-border heritage tourism, and joint conservation initiatives with ASEAN or UNESCO. The importance of creating extensive lists and their use for the future safeguarding of sites cannot be stressed enough.

> “
>
> **It is important to recognise the achievements and contributions of industrial heritage without whitewashing the negative aspects such as indentured labour, corvee and other forms of exploitation, contamination, and environmental impact.**



Figure 5: Tea plantations at Cameron Highlands in Malaysia.
Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

References:

Aguilar, F. V. (2017). Colonial sugar production in the Spanish Philippines: Calamba and Negros compared. Journal of Southeast Asian Studies, 48(2), 237–261. https://doi.org/10.1017/S0022463417000066

Alatas, A., & Wan Sulong, W. S. (2020). The emergence and development of indigenous tea plantations in West Java, 1875–1941. Kemanusiaan: The Asian Journal of Humanities, 27(2), 39–58. https://doi.org/10.21315/kajh2020.27.2.3

Baillargeon, D. (2020). "Imperium in Imperio": The corporation, mining, and governance in British Southeast Asia, 1900–1930. Enterprise & Society, 23(2), 325–356. https://doi.org/10.1017/eso.2020.49

Barker, R. & Molle, F. (2004). Irrigation management in rice-based cropping systems: Issues and challenges in southeast Asia.

Booth, A. E. (2007). Colonial legacies: Economic and social development in East and Southeast Asia. University of Hawai'i Press. https://doi.org/10.2307/j.ctt6wr2vx

Byerlee, D. (2014). The fall and rise again of plantations in tropical Asia: History repeated? Land, 3(3), 574-597. https://doi.org/10.3390/land3030574

Cubeiro Rodríguez, D. (2023). The pearl of the East: the economic impact of the colonial railways in the age of high imperialism in Southeast Asia. Palgrave Studies in Economic History. Palgrave Macmillan. https://doi.org/10.1007/978-3-031-21674-9
Galloway, J. H. (2005).

The modernization of sugar production in Southeast Asia, 1880–1940. Geographical Review, 95(1), 1–23. https://doi.org/10.1111/j.1931-0846.2005.tb00189.x

Hagan, J. & Wells, A. (2005). The British and rubber in Malaya, c1890-1940. University of Wollongong. Conference contribution. https://hdl.handle.net/10779/uow.27794391.v1

Hall, K. (1996). The Textile Industry in Southeast Asia, 1400-1800. Journal of the Economic and Social History of the Orient, 39(2), 87-135. https://doi.org/10.1163/1568520962600055

Henares, I. A. S. (2022). Gathering community and policy support for an industrial heritage trail: the Negros Island Sugar Heritage Trail in the Philippines. Montreal 2022 TICCIH Congress «Industrial Heritage Reloaded» The International Committee for the Conservation of the Industrial Heritage (TICCIH).

ICOMOS & TICCIH (2011). Joint ICOMOS-TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes.

Ignacio, M. T. T., Calaca, F. M., Leyson, J. C., & Tejero, B. S. (2000). The metallurgy of the brass craft industry of Muslim Mindanao. The Mindanao Forum, 15(1), 63–76. https://journals.msuiit.edu.ph/tmf/article/view/260

Junker, L. L. (1990). The organization of intra-regional and long-distance trade in prehispanic Philippines complex societies. Asian Perspectives, 29(2), 167–209.

Junker, L. L. (1994). The development of centralized craft production systems in A.D. 500–1600 Philippine chiefdoms. Journal of Southeast Asian Studies, 25(1), 1–30. https://doi.org/10.1017/S0022463400006652

Lim, K. A., Orillaneda, B. C. and King, C. P. (2021). People and the sea: A values perspective in the conservation management of maritime heritage in the Philippines. International Journal of Asia Pacific Studies, 17(2), 39-73. https://doi.org/10.21315/ijaps2021.17.2.3

Lim Pui Huen, P., Morrison, J. H., & Kwa, C. G. (Eds.) (2000). Oral history in Southeast Asia: Theory and method. ISEAS Publishing.

Loofs-Wissowa, H. H. E. (1983). The Development and Spread of Metallurgy in Southeast Asia: A Review of the Present Evidence. Journal of Southeast Asian Studies, 14(1), 1–11. http://www.jstor.org/stable/20174313

McCarthy, W. (1995). The yards at Cavite: Shipbuilding in the early colonial Philippines. International Journal of Maritime History, 7(2), 149-162.

modern Asian Architectural Network (2011). mAAN Seoul Declaration 2011 on Industrial Heritage in Asia.

Nawiyanto, N., Capili, J., & Calvaryni, N. (2023). The colonial sugar industry in Indonesia and the Philippines: A comparative perspective. Paramita: Historical Studies Journal, 33(2). https://doi.org/10.15294/paramita.v33i2.46347

Njoh, A. J. (2024). Colonial development policies as tools of ecological imperialism in Southeast Asia. Planning Perspectives, 40(4), 975–994. https://doi.org/10.1080/02665433.2024.2420874

Noche, M. and Cruz, S. (2005). Lonely sentinels of the sea: The Spanish lighthouses in the Philippines. Manila: UST Publishing House.

Owen, N. G. (Ed.) (2005). The emergence of modern Southeast Asia: A new history. University of Hawaii Press & Singapore University Press.

Ramenzoni, V. (2024). Copra production at the "end" of the world: Commodity dynamics, peripheralisation, and (under)development in the port town of Ende, Flores, Eastern Indonesia. Crossroads, 23(1), 89-135. https://doi.org/10.1163/26662523-bja10023

Rhodes, M. A. II & Hannum, K. L. (2024). UNESCO, mining heritage and the scalar sustainability of tourism geographies at industrial World Heritage Sites. Journal of Tourism Futures. https://doi.org/10.1108/JTF-10-2023-0235

Robins, J. (2020). Shallow roots: The early oil palm industry in Southeast Asia, 1848–1940. Journal of Southeast Asian Studies, 51(4), 538–560. https://doi.org/10.1017/S0022463420000697

Sham, D. H. M. (2015). Heritage as resistance: Preservation and decolonization in Southeast Asian cities. Doctoral thesis, Goldsmiths, University of London [Thesis].

Tagliacozzo, E. (2005). The lit archipelago: Coast lighting and the imperial optic in insular Southeast Asia, 1860-1910. Technology and Culture, 46(2), 306-328. https://dx.doi.org/10.1353/tech.2005.0102

TICCIH (2003). Nizhny Tagil Charter for the Industrial Heritage.

TICCIH (2012). Taipei Declaration for Asian Industrial Heritage.

Valdez-Bubnov, I. (2020). Trade, war and industrial policy in Southeast Asia: Spanish shipbuilding outside the Philippine Islands (1619–1753). War & Society, 40(1), 43–63. https://doi.org/10.1080/07292473.2021.1860321

Van Engelenhoven, A. (ed.) (2024). Oral traditions in insular Southeast Asia: Lokaswara Nusantara. Cambridge Scholars Publishing.

Ventura, T. (2022). Consider the coconut: Scientific agriculture and the racialization of risk in the American colonial Philippines. Journal of Transnational American Studies, 13(1). http://dx.doi.org/10.5070/T813158137

Yankowski, A. (2019). Salt making and pottery production: Community craft specialization in Alburquerque, Bohol, Philippines. Ethnoarchaeology, 11(2), 134–154. https://doi.org/10.1080/19442890.2019.1642570

Yekti, M. I., Schultz, B., Norken, I. N., Gany, A. H. A., and Hayde, L. (2017). Learning from experiences of ancient subak schemes for participatory irrigation system management in Bali. Irrigation and Drainage, 66, 567–576. https://onlinelibrary.wiley.com/doi/10.1002/ird.2122

Yokokura, M. (1992). Early agriculture in Southeast Asia. Japanese Journal of Southeast Asian Studies, 30(3), 272-314. https://www.jstage.jst.go.jp/article/tak/30/3/30_KJ00000131717/_article/-char/en

The Pre-Modern Industrial Heritage of South-East Asia Concepts, Definitions, Identifications



Richard A. Engelhardt
UNESCO Senior Advisor for Culture and World Heritage Mentor

Richard A. Engelhardt, Jr. has been a leader in cultural heritage research and conservation efforts throughout Asia for the past four decades, teaching at universities throughout the Asia-Pacific region and serving in senior leadership positions with UNESCO. In 1991, he established the UNESCO Office in post-conflict Cambodia and initiated the International Safeguarding Campaign for Angkor. From 1994-2008, he served as UNESCO Regional Advisor for Culture in Asia and the Pacific, and subsequently as UNESCO Senior Advisor for Culture and World Heritage Mentor. During his UNESCO service, Engelhardt initiated the UNESCO Heritage Awards for Cultural Heritage Conservation in Asia; established the UNESCO-ICCROM Asian Academy for Heritage Management; and spearheaded the effort to implement heritage impact assessment for the safeguarding of cultural heritage sites throughout Asia.

Industrial Heritage versus Heritage of the Modern Industrial Age

Within the global World Heritage community, discussions on the identification of and appropriate methodology for safeguarding the industrial heritage of humankind are frequently confounded by terminological confusion and lack of consensus.
This focuses on the definition and characteristics of 'industrial heritage', how sites representing this typology of heritage can be recognised, and what attributes embody the Outstanding Universal Value of this category of heritage.

Often, one hears a confused conflation between the terms, 'industrial heritage' and 'modern heritage'. This confusion results from the application, whether explicitly or implicitly, of a temporal measure ('modern heritage') to a developmental stage of economic production ('industrial heritage'). The result is the popular misunderstanding that 'industrial heritage', is synonymous with, or perhaps a sub-category of the so-called modern architectural heritage of the late 19th and 20th centuries. This carries with it the implication that 'industrial heritage' is defined by the manufacture, on an industrial scale, of materials – principally, steel, glass, and cement – used in the construction of modern architecture in this and subsequent periods.

However, it is instructive to recall that the characteristics of industrial production have long been used for modelling an understanding of the historical development of human societies at a global scale, as well as within individual geographies, since earliest prehistoric times until the present day. While many scholars of history, since Roman times, have suggested a periodisation of human history based on a development theory of industrial production, the currently popular version is that proposed by the British archaeologist, V. Gordon Childe in the middle of the 20th century in his standard-setting publications, *Man Makes Himself* (1936) and *What Happened in History* (1942).

Although modern scholars realise that this division of societies by the dominant mode of industrial production is far too simplistic to reflect the complexity of change and continuity, terms like 'Iron Age', 'Industrial Age', or 'Modern Age' are still used as a very general way of focusing attention on particular times and places.

Particularly relevant for the purposes of this discussion on the industrial heritage of South-East Asia, is the criticism that the broad global application of a system based on successive modes of industrial production is not only overly simplistic, but it is also Eurocentric. Having been developed to describe the economies of the ancient Middle East and Europe, they are not useful in a wider context. Attempts by historians to apply the model to African societies have produced little more than confusion, and in the Americas or Australasia it has been found to be altogether irrelevant.

However, many popular writers have used this model for so long that it has taken on a reality of its own. Despite its rejection by the scholarly community, the understanding of humankind's economic history as an inevitable succession of industrial production modes, repeated everywhere throughout the world, is still alive and well in the popular imagination, including, in the discourse of many who write both in support of and in critique of the World Heritage Convention and its processes.

It is therefore necessary to discard the discredited Eurocentric model, if we are to achieve a credible system for defining, identifying, and safeguarding the physical expressions of what we have come to refer to, in a shorthand fashion, 'industrial heritage', in other areas of the world, including South-East Asia.

The *Dublin Principles*

To understand the South-East Asian context, the concepts underpinning the definition of 'industrial heritage' as it is applied in the context of the World Heritage Convention, it is necessary to base our discussion in the so-called *Dublin Principles*, formally laid out in the document entitled, *Joint ICOMOS – TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes* (adopted by the 17th ICOMOS General Assembly on 28 November 2011).

Referring to the text of the Principles within the box below, the specific vocabulary important for understanding the application of these standard-setting Principles to the South-East Asian context are highlighted.

Attributes of Industrial Heritage

In the words of the *Dublin Principles*, what is considered as 'industrial heritage' under the terms of the World Heritage Convention may be sites, structures, complexes, areas and landscapes as well as machinery, objects, and documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their transformation into goods, and related energy and transport infrastructure. It may be helpful to try to understand this rather

The Dublin Principles

"Preamble: Around the World, a great diversity of sites, structures, complexes, cities and settlements, areas, landscapes and routes bear witness to human activities of industrial extraction and production. In many places, this heritage is still in use and industrialisation is still an active process with a sense of historical continuity, while in other places it offers archaeological evidence of past activities and technologies. Besides the tangible heritage associated with industrial technology and processes, engineering, architecture and town planning, it [industrial heritage] includes many intangible dimensions embodied in the skills, memories and social life of workers and their communities.

The global process of industrialisation observed over the past two centuries constitutes a major stage of human history, making its heritage particularly important and critical to the Modern World. Precursors and beginnings of industrialisation can be recognised in many parts of the world well back into ancient times through active or archaeological sites, and our attention extends to any examples of such process and its heritage....'

Definition: The industrial heritage consists of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their transformation into goods, and the related energy and transport infrastructures.

Industrial heritage reflects the profound connection between the cultural and natural environment, as industrial processes – whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets.

It includes both material assets – immovable and movable –, and intangible dimensions such as technical know how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities and brought major organisational changes to entire societies and the world in general. "

long list of possibilities in terms of their common attributes before attempting to identify specific type sites present in South-East Asia.

Among the attributes of industrial heritage, the following are key:

• Mass production, over and above what is required for subsistence, of large numbers of a single or similar commodity, for wide-scale public distribution, consumption, and/or sale.

• Exploitation of cheap, abundant, and surplus, raw materials to facilitate mass production of multiple re-duplicated finished products.

• Standardised commodity outputs produced and reproduced using mechanical means, involving standardised tasks, hierarchical division of labour, and comparatively large numbers of semi-skilled interchangeable workers.

• High energy inputs to supercharge production.

• Existence of a complementary mechanism or network for widespread market penetration and distribution of resultant products to supply a mass-market demand.

• Market control through monopoly of high-demand utilitarian products meeting basic economic needs, and/or products of high social value or strategic political value.

• Economies of scale allowing for the production and distribution of a product at prices below the comparable cost of custom-made artisanal production.

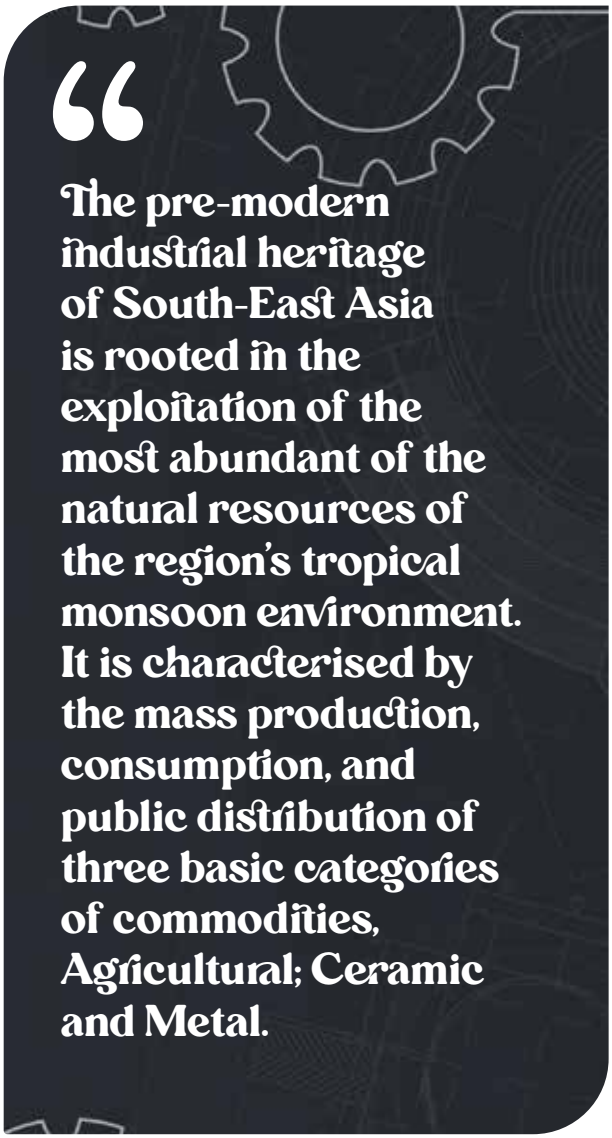
• Valued as economic capital (rather than valued in terms of other forms of capital valuation (spiritual, cultural, environmental, etc.)

Methodology to Develop a Typology of Industries Characteristic of South-East Asia, Past and Present

Considering the current lack of definition that hampers the identification (and therefore the effective safeguarding) of industrial heritage properties located in the countries of South-East Asia, it could be informative to adopt a methodology that will help to construct a typology of these properties that is neither time-bound nor dependent on Western chronologies of industrial development.

Such a logical framework may also prove useful in the identification of industrial heritage properties that may be successfully nominated for inscription on the World Heritage List, in particular those that are both uniquely characteristic of the pre-modern industrial heritage of the geo-cultural region of South-East Asia and fill outstanding gaps in the World Heritage List, thus contributing to the List's representativity and credibility.

However, before moving directly into construction of such a typology and the identification of type sites for possible nomination to the World Heritage List, it is necessary to consider the geo-cultural context of the cultural industries of South-East Asia, as it is understood from the disciplines of the geological, biological, historical and social sciences.



Space limitations do not permit a lengthy discourse on the archaeology and history of economic production in South-East Asia, but, for those not well-versed in the characteristics of the region's geography and history, the following may provide a basic, initial framework for the development of a more detailed typology of the region's industrial heritage in both regional and global perspectives.

In the most fundamental analysis, the pre-modern industrial heritage of South-East Asia is rooted in the exploitation of the most abundant of the natural resources of the region's tropical monsoon environment. It is characterised by the mass production, consumption, and public distribution of three basic categories of commodities, Agricultural; Ceramic and Metal.



Figure 1: Mayoyao Rice Terraces in Ifugao, Philippines. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Agricultural Industries (Food products principally rice, fermented fish, fish sauce, and pickled vegetables)

Ubiquitous water, both inland and sea, provided the source of South-East Asia's subsistence protein – fish and seafood, as well as formed the habitat for farming the region's stable starch, rice. Water collected in reservoirs irrigated year-round cycles of land and water fecundity. The useful life of the resultant produce was prolonged by preservation processing using a combination of fermentation, salting and drying. Through a distribution system controlled through state granaries and rationing, rural subsistence was assured for the general population. Food maintained the large standing military and corvée labour force characteristic of large agrarian empires found in mainland and island South-East Asia from the second half of the first millennium CE, until colonial domination over the local polities one thousand years later.

The labour force supported by this agricultural system were drafted into the military in times of war and, in times of peace, were employed on irrigation and other large-scale construction projects, some of which remain among the largest scale construction works undertaken anywhere in the pre-modern world. In addition to providing support to the conscripted military-labour forces, surplus fermented fish and rice also provided the traditional mainstay in support of the large monastic religious communities of these societies. Together, the combined manpower of the military and the monasteries at times amounted to as much as 25% (in peace times) and 40% (in times of war) of the total male population.

The standing need to provide food for this huge workforce required the systematic industrialisation of the production and processing of the main subsistence food products, which were fermented fish paste and rice, as well as clothing for troops and clergy. This level of surplus production was maintained for hundreds of years by multiple successive polities, and eventually evolved into well-organised, centralised, efficient and sustained agricultural industries, which produced sufficient additional surplus to drive sizable extra-regional agricultural export. By the beginning of the Modern

Age of Global Commerce in the 16th century CE, this provided the basis for the transformation of the South-East Asian traditional agrarian empires into some of the wealthiest trading kingdoms and sultanates anywhere in the world.

Ceramics Industries (building bricks and ceramicware)

Experimentation in prolonging the useful life of agricultural commodities through the manipulation of heat energy had been part of the industrial technology available in South-East Asia since prehistoric times. Archaeological study provides evidence for widespread use of both direct application of heat using fire (e.g. baking, roasting) and indirect methods involving drying and fermentation. From this archaeological evidence, it can be concluded that the application of thermal energy to other materials, specifically to clay, was well established in most local communities across South-East Asia by 6000 BCE. This included the production of low-fired terracotta for domestic and community use, such as water storage jars, cooking pots, and, in several places, burial jars and cremation urns.

Beginning approximately 1000 BCE and rapidly accelerating in scale, organisation, and standardisation for the next 1000 years, the production of sun-dried laterite and fire-baked brick became the key industrial hallmark of the emerging nation-states, particularly those influenced by the Hindu-Buddhist cultures of the Indian sub-continent. The observation of Indian influence in the development of the region's brick technology and industrial development is important because this provides the evidence that the organisation of brick production as an industry of wide-scale mass production was due, not just to labour availability, but directly a consequence of the adoption from India, of industry-wide standard measurements for bricks used in building construction across the region (from Burma across Thailand, Laos and Cambodia into Malaysia, Sumatra and Java.) The adoption of industrial standards in brick construction during the reign of the Indian Emperor Ashoka (n c. 268–232 BCE) was fundamental in enabling the construction of the tallest and largest brick structures to adorn the South-East Asian imperial capitals of Sri Ksetra, Bagan, Si Thep, Devaravati, Angkor, Champa, Sri Vijaya, Mataram, and Majaphait. Later in this same period of increasing industrialisation, industrial standards were adopted for other types of ceramic building components – notably the adoption of Chinese Han Dynasty standards and mass-production kiln technology for making terracotta and stoneware roof tiles.

The potter's wheel was introduced into (or had been invented) in Cambodia by the late 6th or early 7th century CE, enabling mass production and more uniform vessels. The introduction of this innovation is referenced in a contemporary Khmer inscription dated 674 CE, indicating the emerging industrial organisation of ceramic production during the Angkor period. Glazed ceramics appeared in South-East Asia around the 9th–10th centuries CE, particularly among the Pyu of Burma, the Mon of Thailand and the Khmer in Cambodia. These societies were the first in the Asian region (outside China) to master high-temperature firing in closed so-called, dragon updraft kilns (introduced from China), producing durable stoneware with glazed surfaces. By the 13th–15th centuries CE, major kiln sites were in operation in Thailand (Suwankhalok, Kalong, Omgoi) and Viet Nam (Bat Trang). These produced thousands of varied products annually both unglazed and glazed wares, including celadon and underglaze-decorated ceramics, both for domestic use and for export. The use of Chinese industrial standards continued as an "industrial strategy" throughout the South-East Asian region well into the 19th century, as local South-East Asian pottery factories vied to compete, and during times of

internal industrial restrictions within China, to supplant Chinese factories, for the monopolistic mass production of glazed ceramic wares (initially white and green celadon and, later, blue-and-white) for the global export market to India, Central Asia, East Africa, the Persian Gulf and Europe.
Metallurgical Industries (Mineral extraction, processing/smelting, metal casting and decorative metalwork)
Based on the exploitation of easily available near-surface earth minerals and utilising the pyrotechnical knowledge developed in the agricultural and ceramic industries, archaeological evidence for the development of these industries dates back to the protohistoric period. Beginning from somewhere between 3000-2000 BCE at sites in mainland South-East Asia, such as the Phung Nguyen in northern Viet Nam and Ban Chiang in northeastern Thailand, experiments with the use of copper and tin to produce weapons, utilitarian tools, as well as personal ornaments were underway in many communities. Subsequently, the Dong Song culture (ca 500 BCE) developed one of the pre-modern world's most technically sophisticated bronze industries using the lost-was technique, producing not only a wide range of weapons and tools, but the sculptural and elaborately decorated ritual bronze drums that are showpieces of the region's museum.

Organised mining operations and an elaborate network of trade in raw materials (minerals), processed metals, and finished products is evident from systematic archaeological excavation that has been conducted in all countries of South-East Asia since the 1970s, documenting an indigenously developed industry without significant influence from either India or China. South-East Asian metallurgy developed to become a mainstay of the economies of the region throughout the imperial agrarian period when the use of forged metals to make weapons and tools evolved into more technically sophisticated forms, notably in the casting of religious sculptures of Hindu and Buddhist deities, the demand for which was widespread in ancient South-East Asia.



FIGURE 2: Ceramic industry in Thailand. Lighting the fire in Ban Wang Thua.
Photograph by Leedom Lefferts. CC-BY-SA 3.0 IGO

South-East Asia as a source of high-quality minerals and technically reliable processing of metals, specifically, smelting iron, attracted the attention of the militant and powerful Chola Dynasty based in India that controlled the region's maritime commerce from the 3rd to the 14th centuries CE. A robust trade in industrially processed iron ore flourished across the Bay of Bengal based on the production from the mines and foundries in South-East Asia, notably coming from the Bujang Valley region of Kedah on the Malay Peninsula. As the regional economies of South-East Asia transformed into independent trading states in their own right, the metals industry of the region expanded from utilitarian production to the production of technically sophisticated sumptuary ritual objects and personal ornaments using silver, gold, and a unique South-East Asian silver-gold alloy known as nielloware. These objects were, and to this day still are, preserved, curated and exhibited as important cultural treasures by all traditional cultures of the region, from Angkor to Siam and extending to the smallest island sultanates, indicative of the pervasive, widespread and economic significance of the region's traditional metals industry.

The prevalence of these three categories of traditional industry throughout the pre-modern economies of the South-East Asian region is evidenced by the fact that it is unusual to find archaeological evidence for a settlement site that does not include clear evidence of surplus production of at least one, but often all three, of the above categories of industry, and their trade over a considerable catchment area.

While the above summary is very brief and touches on only the three major pre-modern industrial categories (materials, technologies and products) of mainland and island South-East Asia in the pre-colonial period, it is necessary to flag that, as with all forms of industrial development, other complementary industries also arose in support of the big three and sharing the success of their parent industries, developing into significant independent industries in their own right. Some of these complementary industries included, for example:

- **Salt mining and processing** exploiting the ancient mineral deposits on the Korat Plateau of mainland South-East Asia developed on an industrial scale to support the food processing and preservation industry, in particular the fermented fish paste industry of the Tonle Sap and the fermented fish sauce industry of the Mekong Delta.

- **Stone quarrying** in pre-modern South-East Asia was a significant activity linked to the production of tools, construction materials, and monumental architecture, with evidence spanning from the region's earliest Palaeolithic period (at Lenggong Valley) into historic periods. Large-scale quarrying of sandstone was integral to temple and monument construction in all of the region's early empires. The earlier constructions used laterite blocks and clay bricks, while sandstone or volcanic andesite were reserved for architectural details like entrance columns, lintels, and sculptures. However, by the10th century CE, sandstone (in mainland South-East Asia) and andesite (in the islands) became the primary building material for temples.

  Quarried stone was also used extensively in the construction of defensive walls and fortifications. Ninth-century CE sites in Java as well as in mainland South-East Asia feature walls built with carefully cut volcanic stones, sandstone, and occasionally limestone blocks, indicating the use of advanced quarrying and stone-working techniques. Recent archaeological finds include a thousand-year-old

stone quarry in Thailand's Phu Phan Mountain Range, with standard-measure blocks used in Khmer construction activities of the Angkor period still in situ. This illustrates the long-standing tradition of large-scale industrially organised stone quarrying in the region.

- **Gemstone lapidary** (mining, cutting and jewellery making) exploiting the abundant alluvial deposits of rubies, sapphires and topazes of the lower Mekong River. The local market for such luxury goods was driven by their use in Hindu and Buddhist ritual offerings and temple donations as these religions spread across the South-East Asian region from the 2nd century BCE onwards.

- **Silk textile production** (silkworm raising, processing, weaving, dyeing) to meet the insatiable demand for luxury textiles from the Indian, Arab, Chinese, Japanese (and later European and American) markets. The volume of this demand rose to the point that woven textiles from South-East Asia became the barter currency that provided the financial underpinning of the inter-regional import/export trade through which the South-East Asian kingdoms became wealthy in the Early Modern Historic Period (ca 1400-1900 CE).

- **Spices, aromatic woods and medicinal plants.** Both South-East Asia's islands and the coastal mainland have been famous across China, India, the Middle East, and Rome since the first millennium BCE as the source of spices, aromatic woods (such as sandalwood), and medicinal plants. The demand for these commodities was maintained and their prices in the global marketplace were driven upward in times of frequently recurring plagues and disease that ravaged countries and affected particularly communities located along international and regional trade routes. This highly profitable trade was given added value through "industrial business techniques," such as the development of single-species plantations, bulk processing, and hoarding to create monopolies that drove up market prices. These agro-industrial business practices, adopted from the South-East Asian example by the European colonial trading powers in the 16th-18th century CE and applied to other agricultural products such as tea, coffee, sugar, and rubber, became the foundation of the global 'stock market' in commodities and the foundation of the modern capitalist system.

Building on the above basic (albeit overly simplistic) overview and considering that this publication is aimed at identifying possible sites for nomination to the World Heritage List, a more detailed analytical framework model of South-East Asia's pre-modern industrial heritage can now be developed. Structured as a matrix based on the 'mode of production' (i.e. the type of industry or technology,) the three categories of the region's industrial heritage, can be refined and given specificity in terms of their most basic attributes: raw material; representative type site(s); and development chronology (i.e. the historical period when this mode of production was predominant in and characteristic of the economies of the South-East Asian region.)

Partial & Preliminary Typology of Industries Characteristic of South-East Asia

Agriculture Industries

I. Agricultural Surplus Production for Bulk Commodity Export Trade		
RAW MATERIAL (agricultural commodity)	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Rice	Ayerwaddy Plain Chao Phraya Basin Mekong Delta	200-1200 CE 1600 on CE 1900 on CE
Spices, aromatics, medicinal plans	Maluku Islands	1500-2000 CE
Sugar	Maluku Islands	1500-2000 CE
Rubber	Negro/Panay Island Java	1850 on CE 1850 on CE
Rubber	Malay Peninsula	2000-2050 CE

II. Food Processing and Preservation (Salting / Fermentation)		
RAW MATERIAL (salted and fermented food)	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Fermented vegetables	Upper Burma Dry Zone	Early Historic period (Pyu) 1st -11th century CE
Fermented fish paste	Tonle Sap	Historic period (Angkor and others subsequently)
Fermented fish sauce	Mekong Delta	Early Modern period 19th -20th century CE
Salt (as food)	Korat Plateau	Throughout the historical periods

III. Textiles		
RAW MATERIAL (silk and cotton)	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Ikat woven silk	Korat Plateau Khon Kaen vicinity	late prehistory - present
Batik printed silk / cotton	Central Java Jogjakarta Solo	15th century CE - present
Embroidered cotton	Upland Mainland South-East Asia (Hill Tribes diaspora, spec Hmong, Akha, Hmien)	19th -20th century CE

Ceramics Industries

IV. Ceramics		
RAW MATERIAL	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Brown glazed terracotta water and food storage jars	Ayerwaddy Dry Zone	ca 10th -14th century CE
Celadon	Maluku Islands	1500-2000 CE
Blue and white	Maluku Islands	1500-2000 CE

Metallurical Industries

V. Extraction and Pre-Processing of Strategic Minerals for Export		
RAW MATERIAL (mineral)	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Bricks	Upper Burma Sri Ksetr	Early Historic period (Pyu) 1st -11th century CE
Laterite	Chao Phraya Basin Si Thep Nakhon Pathom	Early Historic period (Dvaravati) 3rd -12th century CE
Sandstone blocks	MKulen, Dongrek Mountains Korat Plateau	Historic period (Angkor) 9th -13th century CE

VI. Production and Assembly of Wholesale Construction Materials		
RAW MATERIAL (mineral)	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Bricks	Upper Burma Sri Ksetra	Early Historic period (Pyu) 1st -11th century CE
Laterite	Chao Phraya Basin Si Thep Nakhon Pathom	Early Historicperiod (Dvaravati) 3rd -12th century CE
Sandstone blocks	Kulen, Dongrek Mountains Korat Plateau	Historic period (Angkor) 9th -13th century CE

VII. Gemstones and Jewellery (Luxury Goods)		
RAW MATERIAL	SOUTH-EAST ASIAN REGION	CHRONOLOGY
Glass beads	Kra Peninsula	4th – 9th century CE Gupta period
Gemstone jewellery	Chanthaburi, Pailin	8th century - present
Nielloware gold plated silver	Ligor/Tambralinga Nakhon Si Thammarat	12th – 19th century CE

Emerging Themes in South-East Asia's Traditional (Heritage) Industries

Using the data from the above tables and cross-referencing it with the attributes of industrial heritage outlined in the third section of this essay, it is possible to identify themes specific to and characteristic of South-East Asian industrial heritage from earliest times to the present.

- **Labour dependent:** Due to comparatively high population densities for at least the past 2,000 years, and the fact that the labour force has been centrally organised by the state in permanent readiness for military defence purposes, South-East Asian industries have been able to access cheap mobile organised labour that, because of many individuals predominant rural backgrounds, has skills honed through family apprenticeships that are interchangeably applicable to work with a diversity of earth, water, forest, and agricultural resources.

- **Earth minerals exploitation:** Geologically, the South-East Asian region is characterised by easily accessible earth minerals (e.g. igneous stone, sandstone, limestone, clay, iron, tin, coal, peat, and sedimentary deposits of precious gemstones.) These minerals are located on or near the surface of the earth as the result of long exposed weathering in the tropical monsoon environment, with the periodic distributions of desertification and/or glacial ice cover that is characteristic of many other areas of the planet. From earliest prehistoric times until the 20th century, exploitation of earth minerals has provided both raw materials in the form of minerals, and energy inputs in the form of fossil fuels for the development of indigenous South-East Asian industries of scale, in particular industries whose processes require thermal heat energy inputs.

- **Hydrological energy inputs:** Energy-charged water resources are pervasive throughout South-East Asia, from the many large, fast-moving rivers and their tributaries with their sources high in the Himalayas, monsoon wind driven seas, and abundant predictable and dependable rainfall. Throughout South-East Asia, traditional industrial development has relied on access to water energies for production, processing and transportation.

- **Food production surplus:** Abundant and ubiquitously available water resources provide the source of South-East Asia's subsistence protein – fish and seafood, and the habitat for farming the region's stable starch, rice. Reserved water irrigated year-round cycles of land and water fecundity. The use-life of the resultant produce was prolonged by preservation processing using a combination of salting and fermentation, with distribution controlled through state granaries and food distribution systems. These provided rural subsistence for the general population, supplied the food needed to maintain the large, standing conscripted service cohorts (responsible for both military duty and civil infrastructure, construction and maintenance,) and supported large monastic communities, while also producing sufficient surplus to support lucrative extra-regional export trade in agricultural staples, especially to China.

These shared themes constitute a geo-cultural identification that is characteristic of South-East Asian industrial heritage.

Attributes of South-East Industrial Heritage of the Pre-Modern Period

This analysis can be taken a step further by identifying what attributes of all (or most) of the above industries contribute to the universal, extra-regional, even global impact. This consideration will be important in the evaluation of the potential Outstanding Universal Value (OUV) of each industry - a key element in the determination of the types of sites representing an industry that may be eligible for nomination to the World Heritage List.

Consideration of the extra-regional, global impact of traditional South-East Asian industries also has important implications for the strategy used to put forward one or more of these sites for inscription. Important considerations are as follows:

- **Originality Innovation Authenticity.** The most obvious attribute of all the above industries (except for the teak logging, sugar and rubber industries of the colonial period) that contributes to their potential OUV is that they have pre-modern roots within South-East Asia, as evidenced by dated archaeological research. This evidence underscores the geo-cultural originality as well as the innovative nature and authenticity of an industry. While this may seem to be a given within a debate where regional significance is assumed, it is important to understand that in the global academic discourse on industry as a chronological marker of cultural development (discussed above in the first section,) diffusion from a single original source has been the cornerstone assumption of analysis for the past 200 years, with earlier roots appearing back as far as early Roman histories of the world. The diffusion (versus the indigenous origin and local development) of industrial technology has been (and continues to be) the single most contentious and hotly debated argument within the community of archaeologists and cultural historians precisely because it is at the backbone of the definition of cultural identify and therefore cultural rights. The definition and identification of industrial heritage lies squarely in the middle of this debate which is central to the credibility of the 1972 World Heritage Convention, as well as to the 2003 Convention for the Safeguarding of the Intangible Culture Heritage and the 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions.

- **Extra-Regional Market Distribution Mechanism.** It is remarkable and distinctive that all the major indigenous industries of South-East Asia have been traditionally marketed through a system of multiple point-of-production entrepot sales on demand (not through monopolistic control of export trade of surplus supply as practiced by China, India, and the European colonial powers.) The modern exceptions to this (teak logging, sugar, rubber) were industries initiated and controlled by colonial powers, exploiting South-East Asian resources and labour.

- **Transboundary Serial Site Strategy.** The entire typological range of traditional pre-modern industrial heritage characteristic of the South-East Asian geo-cultural region is present in numerous sites (not in unique single locations), indicating the time depth of their cross-regional roots. Many of the industries concerned have important type sites present in and shared across modern-day political borders. This suggests that a nomination structure involving serial or transnational serial nominations could be appropriate.

Narratives of OUV: South-East Asian Industrial Heritage

Following the construction of a typology of characteristic South-East Asian pre-modern industries, it is now possible to develop narratives of their Outstanding Universal Value (OUV) which could potentially qualify type sites of some of these traditional industries for nomination to the World Heritage List.

To construct compelling narratives of OUV, it would be useful first to review and from the above discussion a summary of OUV attributes of pre-modern South-East Asian industries:

South-East Asia is a unique and distinctive region:

• Located at a crossroads of pre-modern global shipping trade routes, as determined by geography and monsoon weather patterns.

• Contains one of the world's areas of highest flora and fauna biodiversity and productivity both on land and in water.

• Has abundant and easily accessible (near surface) earth minerals due to ancient weathering.

• Has water resources that are ubiquitously available and harnessed with a simple hydro-engineering technology, based on a bund-and-dyke field system replicated at multiple scales from small farm fields across the entire landscape of the region to the construction of the world's largest pre-modern water reservoirs used to charge the irrigation distribution system using gravity-driven hydro-power.

• Contains annual sustainable surplus food production exceeds subsistence needs, thus enabling commoditisation and exportation of the surplus.

• Developed early standardisation of construction materials, forms, engineering techniques, recorded with simple graphic documentation, and implemented under the supervision of hereditary master builders.

• Has abundant semi-skilled labour, possessing a diversity of rudimentary skill specialisations acquired through family apprenticeships.

ca 400 -1400 CE — **PROTOHISTORIC State-controlled monopolies of staple food production** distributed internally to support corvee labour systems; with surplus monetised and sold on the regional export market: salted fish/shrimp paste; picked vegetables; rice

ca 800 -1600 CE — **EARLY HISTORIC Labour-intensive, large-scale extraction of earth minerals used in the mass production of standardised building construction components** manufactured for both local sale and export: stone, laterite, brick, tile, and other ceramic forms, focused on pottery production

ca 1200 -1800 CE — **HISTORIC On-demand production of sumptuary ritual and luxury goods:** glass beads and bangles, gemstone jewellery, textiles, silver and gold

ca 1600 -2000 CE — **COLONIAL Early Modern Period global monopolies of strategic materials controlled by colonial powers:** spices, timber, rubber, tin

• Has available demand-driven market distribution through a multiplicity of points-of-sale.

Consolidating the archaeological and historical evidence for the industrial organisation of production utilising the above strategic resources, it is possible to identify the following types of industries that existed, flourished, and characterised the economies of pre-modern South-East Asia, within a broad relative chronology: On the basis of the above analysis, it is possible to compose five narratives of Outstanding Universal Value of the industrial heritage of South-East Asia from earliest times until the Modern Industrial Revolution of the late 19th and early 20th centuries CE.

Composing these archaeological and historical narratives in terms of their global significance allows their use in presenting truthful and credible arguments for proposing representative type sites for inscription on the World Heritage List.

NARRATIVE 1: Early Agrarian Surplus Food Production and Processing. State monopolies of staple food production restricting access to food staples through political organisation of labour; organised as state monopolies of foodstuffs for distribution to dependent local populations (rice, salt, salted fish paste; fish sauce)

NARRATIVE 2: Standardised Production to Supply the Emerging Regional Construction Industries. Intra-regional driven construction industries: offshore mass production and pre-processing of building components for import (iron, bricks)

NARRATIVE 3: Manufacture of Currency-Proxy Luxury Barter Goods. On-order, value-added production of sumptuary luxury goods (textiles, beads, gemstones, jewellery)

NARRATIVE 4: Early Modern (pre-1800 CE) Global Trade Commodities. Monopoly export competition / substitution (glazed ceramics, spices)

NARRATIVE 5: Colonial Era (post-1800 CE) Strategic Materials. Extraction of globally-strategic raw materials needed by international capitalist markets (timber, tin, coal, rubber)

Comparative Analysis and Gap Identification

After composing a credible narrative of the Outstanding Universal Value for a property nominated to the World Heritage List, the next step towards a successful inscription is to demonstrate how a property proposed for inscription fills a gap in the existing roster of Inscribed Properties and so contributes to a fully representative List, credibly reflecting the range and diversity of World Heritage.

The basic methodology recommended by the Operational Guideline of the World Heritage Convention for establishing a "comparative analysis" of a prospective nomination is to undertake an ordered, critical evaluation of the proposed property in terms of its:

- integrity
- authenticity
- attributes
- narrative of OUV
- representativity
- ability to fill a gap in the List

To apply this methodological framework to industrial heritage sites, a proposed property need to be checked to confirm that it demonstrates the defining evidence of industrial heritage sites. This includes:

- Extraction/collection of raw materials
- Production/reproduction of materials
- Processing of components
- Transformation of components into goods

- Energy
- Labour
- Tools and machinery
- Storage infrastructure
- Market infrastructure
- Transportation infrastructure

And potentially, evidence of:

- Recycling
- Discard
- Site decommissioning

From the above checklist of the components of industrial heritage sites, it is obvious that industrial heritage is not simply defined as a commodity but instead consists of a complex of inter-related technologies, that need to be identified individually as well as in their articulation with other parts of the industrial complex under analysis.

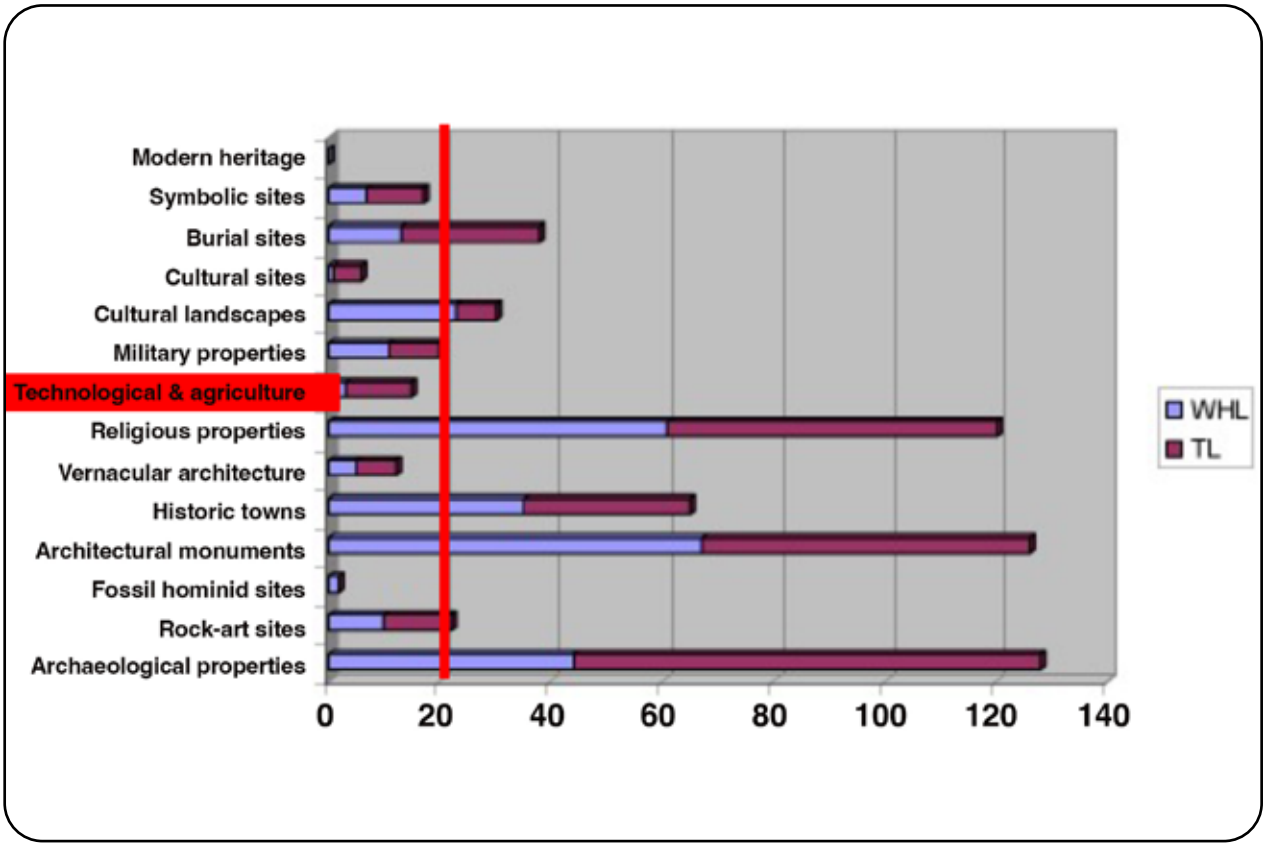
With this understanding of industrial heritage as a complex of attributes, it is possible to examine the industrial heritage properties currently inscribed on the World Heritage List and understand where the gaps are in relation to the typology of industrial heritage present in pre-modern South-East Asia, as discussed above.
In their analysis of gaps on the World Heritage List (see chart below,) ICOMOS has identified industrial heritage as an identified gap in the representative list properties in Asia, with fewer than 15 sites, either already inscribed and on the Tentative Lists of the region's States Parties.

List of Inscribed Industrial Heritage Sites in South-East Asia

Stone Tool-Making
Archaeological Heritage of the Lenggong Valley, Malaysia

Modern Industrial Complex
Ombilan Coal Mining Heritage of Sawahlunto, Indonesia

Gap Analysis
Comparison of World Heritage List and Tentative Lists for Asia and the Pacific



CONCLUSION

Potential Nominations of Industrial Heritage Properties in South-East Asia to fill gaps on the World Heritage List

From the above analysis, it is clear that already inscribed industrial heritage sites in Asia (as a whole) are limited to properties that are limited to mineral extraction (silver, gold, coal), water energy infrastructure and inland transportation infrastructure.

The gaps identified in the typology of South-East Asian industrial heritage therefore suggest that new sites could be nominated to the World Heritage List that demonstrate the region's narratives of outstanding universal value and also fill gaps on the World Heritage list.

Specifically, under **Narrative 1** these sites could include state monopolies of staple food production, which restricted access to food staples through political organisation of labour, creating organised state monopolies of foodstuffs for distribution to dependent local populations (rice, salt, salted fish paste; fish sauce). The nominated properties could include fields systems of intensive single-crop food production (rice, sesame, mung beans, including supporting irrigation systems), sites showing evidence of repeated, large-scale agricultural commodity processing, especially fermentation of fish paste and production of fermented fish sauce, and sites with facilities for bulk food storage and public re-distribution.

For **Narrative 2**, which covers standardised production to supply emerging regional construction industries, sites could include mining, smelting, and other facilities for extraction and pre-processing of industrial metals, especially iron, factories for standardised brick manufacture, sites with in-situ evidence of stone quarrying, and lime mortar production facilities.

Narrative 3 focuses on the manufacture of currency-proxy luxury barter goods such as textiles, beads, gemstones, and jewellery. In practice, this could include sites that produced on-order value-added production of sumptuary luxury goods, workshops for glass bead and bangle making, smithies for working in precious metals and gemstone jewellery, and silk textile farming, processing, weaving, and dyeing production facilities, involving either ikat or batik.

Early Modern (pre-1800 CE) Global Trade Commodities are covered by **Narrative 4**, which includes monopoly export competition/substitution (glazed ceramics, spices) in particular. Sites could include those that produced high-fired glazed ceramics. Also potentially significant are sites associated with the production of spices, aromatics, wood, and medicinal plants as well as those associated with storage and sales consolidation facilities. Also significant are sites relating to seaborn water transportation infrastructure, including ship building and port construction (such as dredging and infrastructure facilities, navigation technology, lighthouses and river training).

Finally, **Narrative 5** embraces the Colonial Era (post-1800 CE) and Strategic Materials. This covers the extraction of globally strategic raw materials in demand by international capitalist markets such as timber, tin, coal, sugar, and rubber. Specifically, this includes teak logging infrastructure (river dams, sawmills, etc), tin mine dredging machinery and landscape features such as artificial ponds. Other important sites include sugar plantations and refineries and associated storage and distribution facilities, as well as rubber plantations and processing laboratories.

References:

Abd Halim, M.H., Talib, N.K., Jusoh, A.F., Masnan, S.S.K., & Saidin, M. (2025). "New Evidence of Ancient Kedah iron Smelting Sites at Sungai Batu Archaeological Complex (SBAC), Bujang Valley, Kedah, Malaysia." The Bulletin of the Geological Society of Malaysia, 66. Kuala Lumpur: Department of Geology, University of Malaysia. Available online at: DOI: https://doi.org/10.1016/j.aseas.2024.03.011.

Boomgaard, Peter (2005). "Labour, Land, and Capital in Pre-Modern and Early-Modern South-East Asia." Boomgaard, Peter, David Henley, and Manon Osseweijer, eds.Muddied Waters: Historical and Contemporary Perspectives on Management of Forests and Fisheries in Island South-East Asia. Leiden: KITLV Press.

Brown, Roxanna M. (1988). The Ceramics of South-East Asia: Their Dating and Identification. Singapore: South-East Asia Ceramic Society.

C. Huang et al. (2023), "Spatio-Temporal Dynamics of Terrestrial Net Ecosystem Productivity in the ASEAN from 2001 to 2020," Science of the Total Environment, Amsterdam: Elsevier B.V. (ELSEVIER SCI LTD.

Castillo, Cristina Cobo, BŽrŽnice Bellina, and Dorian Q. Fuller (2017). "Rice, Beans and Trade Crops on the Early Maritime Silk Route in South-East Asia," Antiquity 9, Cambridge: Cambridge University Press.

Childe, V. Gordon (1936). Man Makes Himself. London: Watts & Co.

Childe, V. Gordon)1942). What Happened in History. London: Harmondsworth: Penguin Books.

Falser, Michael (2001). "Is Industrial Heritage Under-Represented on the World Heritage List?" Global Strategy Studies, Paris: UNESCO World Heritage Centre. Unpublished mass available online at: https://whc.unesco.org/archive/ind-study01.pdf

Greene, Kevin (1993). "The Study of Roman Technology: Some Theoretical Constraints," Trends in Analytical Chemistry (TRAC), Amsterdam: Elsevier B.V. (ELSEVIER SCI LTD.

Guy, John (1998). Woven Cargoes: Indian Textiles in the East. London: Thames and Hudson.

Hernandez, V.C., M.W. Morley, A.M. Bacon, P. Duringer, K.E. Westaway, R. Joannes-Boyau, J.L. Ponche, C. Zanolli, P. Sichanthongtip, S. Boualaphane, T. Luangkhoth, J.J. Hublin, F. Demeter (2024). 'Late PleistoceneÐHolocene (52Ð10 ka) Microstratigraphy, Fossil Taphonomy and Depositional Environments from Tam Pa Ling Cave (northeastern Laos),' Quaternary Science Reviews 2024. Amsterdam: Elsevier B.V. (ELSEVIER SCI LTD. Available online at: DOI: 10.1016/j.quascirev.2024.108982

Higham, C. F. W. (2024). "Aggrandisers and the First Copper-Base metallurgy in South-East Asia." Antiquity, 12 February 2024,Cambridge: Cambridge University Press, Available online at: DOI: 10.15184/aqy.2024.14.

ICOMOS (2005). The World Heritage List: Filling the Gaps Ñ An Action Plan for the Future, Monuments and Sites XII, Paris: ICOMOS International Secretariat.

ICOMOS, and TICCIH (2011). "Joint ICOMOS-TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes." Adopted by the 17th ICOMOS General Assembly, 28 Nov. 2011. The Dublin Principles. Paris. Available online at: https://www.icomos.org/images/DOCUMENTS/Charters/GA2011_ICOMOS_TICCIH_joint_principles_EN_FR_final_20120110.pdf

Kanungo, Alok Kumar (ed.) (2017). Stone Beads of South and South-East Asia: Archaeology, Ethnography, and Global Connections. New Delhi: Aryan Books International. ISBN: 9788173055850.

Miksic, John (ed.) (2003). Earthenware in South-East Asia: Proceedings of the Singapore Symposium on Pre-Modern South-East Asian Earthenwares. Singapore: Singapore University Press. Published with the assistance of the South-East Asian Ceramic Society.

Myint Aung and Elizabeth Moore (1991). "Finger-Marked Designs on Ancient Bricks in Myanmar," Journal of the Siam Society, Vol. 79, No. 2, 1991, Bangkok: The Siam Society Under Royal Patronage.

Reid, Anthony (1988, 1993). South-East Asia in the Age of Commerce, 1450-1680: Volume One: The Lands Below the Winds. New Haven: Yale University Press, 1988, and Reid, Anthony. South-East Asia in the Age of Commerce, 1450-1680: Volume Two: Expansion and Crisis. New Haven: Yale University Press, 1993.

Shackel, Paul A., and Mary C. Beaudry (eds.) (2006). "The Importance of Archaeology and the Meaning of the Industrial Past." in Industrial Archaeology: Future Directions. Berlin: Springer Nature.

Sun, J., and K. Ikebe (2023). "Characteristics of heritage of Industrial Modernization and Urban Spatial Distribution in Shenyang, China." Journal of Asian Architecture and Building Engineering, 22(3), Abingdon, Oxfordshire: Francis and Taylor, Ltd.

Tieng, Foo Shu (2019). "Salt Making and Prehistoric Shell Middens in the Straits of Melaka," Advancing South-East Asian Archaeology 2019: Selected Papers from the Third SEAMEO SPAFA International Conference on South-East Asian Archaeology, Bangkok: SEAMEO SPAFA.

Uchida, E., Watanabe, R., Murasugi, M., Sakurai, Y., & Shimoda, I. (2020). "The Sandstone Quarries of the Angkor Monuments in the South-Eastern Foothills of Kulen Mountain," Archaeological Discovery, 8, Wuhan: Scientific Research Publishing (SCIRP). Available online at: DOI: 10.4236/ad.2020.83012.

UNESCO World Heritage Committee (2025). Operational Guidelines for the Implementation of the World Heritage Convention (WHC.25/01, 16 July 2025). Paris: UNESCO World Heritage Centre. Available online at: https://whc.unesco.org/en/guidelines.

White, J. Peter, and J. Golson (1981). "Diffusionism in Archaeological Theory: The Good, The Bad, and The Ugly," Allen, J. and O'Connell, J. (eds.) (1981). Prehistory of Australia, New Guinea and Sahul, London: Academic Press.

Widodo, Johannes (2019). "Conserving Industrial Architecture in Asia: Problems and Prospects," in SARGA Jurnal Ilmiah Arsitektur dan Perkotaan 2019, Edisi Genap 2018-2019, Vol 1. Kabupaten Deli Serdang, Provinsi Sumatera, Indonesia. Available online at: Utarahttp://jurnal

The Complex Legacy of Industrial Heritage in South-East Asia: A Critical Perspective



Johannes Widodo
National University of Singapore

A professor at the National University of Singapore, MA Architectural Conservation Programme. Affiliations: mAAN (modern Asian Architecture Network) founder & executive, AAHM (Asian Academy for Heritage Management) executive committee, UNESCO Asia Pacific Awards for Cultural Heritage Conservation jury, ICOMOS ISC member, ICOMOS National Committee (Indonesia and Singapore) founder, Docomomo (Macau and Singapore) founder, iNTA (International Network of Tropical Architecture) founder & executive, TCHS (The Circle for Human Sustainability) member, and SEACHA (South East Asian Cultural Heritage Alliance) founder and advisory board member.

Introduction: Rethinking Industrial Heritage in South-East Asia

The industrial heritage of South-East Asia presents a complex and layered narrative. Industrial sites, often celebrated as markers of economic progress and technological advancement, also bear the scars of colonial exploitation, forced labour, and environmental degradation. Unlike the predominantly post-industrial landscapes in the West, South-East Asian industrial heritage remains an active, evolving part of the cultural and physical landscape. This cross-boundary and ongoing industrial activity complicates heritage site identification, interpretation, and preservation.

mAAN Seoul Declaration 2011 on Industrial Heritage in Asia

The *'mAAN Seoul Declaration on Industrial Heritage in Asia'* was announced on 26 August 2011 during the mAAN Seoul 2011 International Conference on 'Our Living Heritage: Industrial Buildings and Sites of Asia', organised by mAAN International and mAAN Korea in cooperation with the Ministry of Culture, Sports and Tourism of Republic of Korea, Seoul Museum of History, ICOMOS Korea, ICOMOS Shared Built Heritage Commission, and TICCIH (International Committee for the Conservation of the Industrial Heritage), in Seoul, 25-27 August 2011.

The mAAN Seoul Declaration

"1. Recognising, understanding, interpreting and harnessing 'Industry' as 'heritage' is a challenge in Asia.

2. Our industrial past is a complex phenomenon:

i) Industry in Asia, unlike many parts of the post-industrialised West, is still alive and very much a part of our physical and cultural landscape today. It is under continuous and sometimes rapid change. This time & distance required to view this as 'heritage' is one reason for this.

ii) Industrial past is not static & tangible. It is a process connecting sites of production and its transfer & consumption through a complex network.

iii) Where the industrial past has been lost or ceased to remain in action, its memory contributes to the sense of identity at various levels (personal, local, regional, national etc).

iv) One aspect of this complexity comes from the painful association with industry that many Asian sites carry. The discontents of an exploitative industrial past can alienate us and highlight our differences. At the same time a cultural landscape that industry has created though continuity and exchange presents us an opportunity to seek each other's investment in our past, making it shared and mutual. The sharing may not always be equal, the gratification not always mutual but the difference provides texture & colour to this landscape. It is in the context of this 'unequalness' that we must place our exploration, interpretation and (re)appropriation.

v)Industry is inherently 'local' as it is specific to a site, a community and/or exists in the memory of a certain group of people geographically localized to a certain place. However, the connections that it establishes through shared technology, investment, and consumption represent its 'global' nature. This simultaneous duality and dynamism is a nature of our industrial past.

vi) In Asia we need to see place industrial heritage in the context of the evolving industrial process taking place in period where we have experienced the far-reaching effects of post- war, post-colonial transitions, unprecedented economic development urbanization condensed into a period a few decades.

3. We seek to expand our understanding of industrial heritage in Asia to include traditional industries that remain living and vital to our culture and not restrict it solely to heritage associated with development paradigms rooted in the industrial revolution in the west. Developing the tacit knowledge of practices, crafts skills and cultural systems necessary for continuance of many production processes is important for this understanding.

4. Industry represents the critical & fragile connection between nature & us. The relationship between industry and ecology is crucial to discussion on sustainability. Emerging challenges of 'climate change' and lessons from our collective industrial past holds valuable lessons towards our present concern for achieving development with sustainability. This presents the opportunity to expand the traditional boundaries of the subject of heritage studies by placing it as a discipline that can actively contribute to current urban issues.

5. The understanding of the culture of industry and industry as culture needs to be reflected upon. We need to devote time & space to this discussion. We must, during this engagement, cooperate and collaborate with different disciplines, diverse scholarships and wider community to enrich this complex exploration."

The *mAAN Seoul Declaration 2011* underscores the dual nature of industrial heritage: it is both local and global, embedded in specific communities and interconnected through broader production and consumption networks. This perspective reframes industrial heritage not as static architectural relics but as dynamic cultural landscapes. It further emphasises the need for comprehensive documentation, inventory, and reinterpretation of industrial sites to ensure that marginalised narratives — particularly those of exploited labourers — are not eclipsed by the dominant discourse of economic progress and the touristic agenda.

Adaptive Reuse: Restoring Structures or Rewriting Narratives?

Adaptive reuse is widely promoted as a sustainable approach to heritage conservation in rapidly urbanising regions like South-East Asia. It involves repurposing industrial structures for contemporary use while ostensibly preserving their architectural integrity (Ting, 2015). However, the *mAAN Seoul Declaration* cautions against selective reinterpretation prioritising economic utility over historical accuracy.

> **Unlike the predominantly post-industrial landscapes in the West, South-East Asian industrial heritage remains an active, evolving part of the cultural and physical landscape.**

A case in point is the Saint James Power Station in Singapore. Originally constructed as a coal-fired electricity power station in the 1920s, it was later repurposed as a nightclub and subsequently as the regional headquarters of the global corporation, Dyson. While this transformation signifies economic adaptation, it also risks erasing the site's industrial and labour histories, particularly the narratives of workers who toiled under hazardous conditions (Ting, 2015). It also demonstrated the inappropriate adaptive reuse and late recognition of its significance in Singapore's modernisation process.

Similarly, the Ombilin Coal Mining Heritage of Sawahlunto in Indonesia, a UNESCO World Heritage Site listed in 2019, is celebrated for its industrial technological ensemble and architecture. However, narratives of forced labourers — many of whom were conscripted under brutal colonial regimes — remain underrepresented in the site's official interpretation (Suryadi, 2022). It's Outstanding Universal Value is also mainly focused on colonial legacy, rather than the comprehensive layers of the historical pre- and post-colonial cultural landscape.

Furthermore, adaptive reuse projects should focus on economic revitalisation and prioritise comprehensive documentation and inventory to capture industrial sites' socio-historical context and cultural landscape. Accurate records of histories, environmental impacts, and the community's social and cultural context provide a foundation for authentic, inclusive, and just reinterpretation.

Sustainability: Green Restoration or Selective Memory?

Sustainability is frequently positioned as a progressive strategy in the adaptive reuse of industrial heritage. However, the *mAAN Seoul Declaration* warns that environmental restoration should not overshadow socio-historical contexts. The transformation of the former Thai Tobacco Monopoly site into Benjakitti Park in Bangkok exemplifies this tension. The park's design incorporates sponge city principles to mitigate flooding and promote urban cooling (Bangkok Post, 2023). While the project is lauded as a model of sustainable urban development, the narratives of factory workers, many of whom faced exploitative working conditions, remain conspicuously absent from the site's new narrative. This selective memory raises critical questions about whose histories are privileged and which are erased in ecological restoration.

Similarly, former tin mining areas in Malaysia have been reimagined as eco-tourism destinations. Projects incorporating solar panels and water management systems reflect a commitment to environmental sustainability (Yin, Tan, and Ahmad, 2022), although solar panels are problematic regarding recycling and their ecological pollution impact. Yet, the labour histories of workers, the socio-economic disruptions, and environmental destruction caused by mining are mainly excluded from redevelopment and touristic narratives.

Balancing environmental and socio-historical narratives is necessary. By integrating comprehensive documentation and reinterpretation, sustainability frameworks can become more inclusive, ensuring that industrial sites showcase green restoration and engage with complex histories of exploitation, resistance, and resilience.

Inclusive Narratives: Whose History is Remembered?

Asian industrial sites are not neutral spaces but contested landscapes shaped by power dynamics and socio-economic inequality. As such, the reinterpretation of industrial heritage must actively include marginalised voices. In Sawahlunto, Indonesia, the dominant narrative emphasises the architectural significance of the Ombilin Coal Mining colonial heritage. However, the stories of Javanese, Sundanese and Chinese labourers conscripted into forced labour during the colonial era, although acknowledged, remain peripheral to the discourse (Suryadi, 2022). The ongoing efforts to document these labour histories represent a gradual but necessary shift towards a more inclusive narrative framework.

The Dutch-built sugar factory, dating back to 1908, has been transformed into the Heritage Rest Area in Brebes, Central Java, Indonesia. Now a highway rest area with local food, souvenirs, and EV charging, it blends vintage architecture with modern convenience. However, this adaptive reuse

> **"Adaptive reuse projects should focus on economic revitalisation and prioritise comprehensive documentation and inventory to capture industrial sites' socio-historical context and cultural landscape.**

commodifies history, erasing the deeper narrative of colonial economic structures, oppression, and exploitation. Instead of fostering critical reflection, it repackages the past as an aesthetic experience for consumption.

Thus, inclusive reinterpretation is not only about filling gaps in the historical record but also about balancing the narrative, ensuring that industrial heritage is understood through its architectural or economic significance, socio-cultural impacts, and correct conservation and adaptive reuse practice.

Conclusion: Reclaiming Industrial Heritage as a Platform for Historical Justice

South-East Asia's industrial heritage offers a unique opportunity to reframe the global narrative of industrialisation. While the dominant discourse surrounding the Industrial Revolution often centres on technological advancements and economic progress, the South-East Asian perspective foregrounds industrialisation's human costs, socio-cultural disruptions, and environmental consequences.

The *mAAN Seoul Declaration* emphasizes that industrial sites in Asia are not merely architectural relics but dynamic cultural landscapes where the legacies of labour exploitation, forced migration, and environmental degradation converge. To effectively engage with these complexities, the documentation and inventory of industrial sites must be prioritized. Accurate records of labour histories, community displacement, and socio-economic impacts are vital for heritage preservation and for ensuring that future reinterpretations are grounded in historical accuracy.

Moreover, reinterpretation counterbalances outdated narratives of the Industrial Revolution, which often marginalises the global South. South-East Asia can assert its distinct perspective on industrial heritage by centring the experiences of marginalised communities,



Figure 1: Benjakitti Forrest Park, Bangkok: a former tobacco factory site has become a low-maintenance sponge city, regulating stormwater, cleansing water, and creating downtown's largest public space. Photograph by Johannes Widodo. CC-BY-SA 3.0 IGO

integrating socio-cultural narratives into the heritage discourse, and simultaneously including a comprehensive mapping of the contextual historical cultural landscape, highlighting the region's pivotal yet underrepresented role in global industrialisation.

This way, industrial heritage can be reclaimed as a platform for historical and social justice, fostering deeper historical understanding and broader socio-cultural dialogue. By embracing comprehensive documentation, inclusive reinterpretation, and sustainable adaptive reuse, Southeast Asia can preserve its industrial heritage and reshape the global discourse, transforming industrial sites into spaces of justice, remembrance, resilience, and reconciliation.

> "Thus, inclusive reinterpretation is not only about filling gaps in the historical record but also about balancing the narrative, ensuring that industrial heritage is understood through its architectural or economic significance, socio-cultural impacts, and correct conservation and adaptive reuse practice.



Figure 2: Piles of numbered tombstones without names of the forced coal mining labourers in the Ombilin Coal Mining Heritage in the Sawahlunto museum. Photograph by Johannes Widodo. CC-BY-SA 3.0 IGO

References:

Bangkok Post, 2023. Benjakitti Forest Park: Bangkok's Urban Oasis. [Accessed 12 May 2025].

mAAN Seoul Declaration 2011 on Industrial Heritage in Asia. International Conference on "Our Living Heritage: Industrial Buildings and Sites of Asia," Seoul, 25-27 August 2011.

Suryadi, R., 2022. Contested Memories in Industrial Heritage Sites: The Case of Ombilin, Indonesia. Southeast Asian Heritage Journal, 12(2), pp. 94-105.

Ting, K., 2015. Singapore Chronicles – Heritage. Singapore: Institute of Policies Studies & Straits Times Press.

Yin, Z., Tan, L., and Ahmad, S., 2022. Sustainable Adaptive Reuse of Industrial Sites in Malaysia: Challenges and Opportunities. Journal of Urban Ecology, 16(3), pp. 205-220.

Reading South-East Asia's Industrial Heritage Through The Twentieth-Century Historic Thematic Framework

The International Scientific Committee on 20th Century Heritage (ISC20C)

As an expert body operating under the auspices of ICOMOS, the International Scientific Committee on 20th Century Heritage (ISC20C) promotes the recognition, conservation, and management of twentieth-century heritage. Established in 2005, ISC20C brings together specialists from diverse regions and disciplines to address the wide range of cultural and regional expressions in modern heritage and to actively advance current scientific knowledge in the field. The Committee oversees the development of conservation principles, advocates for at-risk sites, advises within ICOMOS and externally on World Heritage listing and management of modern heritage places, and facilitates professional exchange by fostering best practices and global dialogue on twentieth-century heritage.
https://isc20c.icomos.org/

This essay was written by South-East Asian members of ISC20C:

Dominic Q. Galicia
Principal Architect, Dominic Galicia Architects
Expert Member, ICOMOS ISC20C

Ho Weng Hin
Co-Founder and Principal Conservation Specialist Consultant, Studio Lapis
Vice President, ICOMOS ISC20C

The Twentieth-Century Historic Thematic Framework

The Twentieth-Century Historic Thematic Framework (HTF), developed by Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), offers the UNESCO-TICCIH Thematic Study on the Industrial Heritage of South-East Asia a tool to support the interpretation of South-East Asia's 20th-century industrial heritage. The tool complements previous resources developed by the ISC20C as reference texts for supporting research and practice in the conservation and management of twentieth-century heritage. *The Madrid–New Delhi Document* (ICOMOS International Scientific Committee on 20th Century Heritage, 2017) outlines fundamental approaches to the conservation of modern heritage, while the *Cadiz Document* (ICOMOS International Scientific Committee on 20th Century Heritage, 2021) offers detailed guidelines for the conservation of concrete heritage.

Specifically, by considering the lens of human activities, such as agriculture, manufacturing, mobility, trade and technology, the HTF identifies and analyses the principal social, technological, political, and economic drivers that have shaped the buildings, cities, industries, and landscapes of the twentieth century, emphasizing global forces, trends, and phenomena that have shaped the built environment (Marsden and Spearritt et al., 2021).This thematic approach proves especially effective in South-East Asia,

where colonial pasts, rapid postcolonial industrialisation, and diverse cultural trajectories intersect and converge. South-East Asia consists of 11 countries: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam. Except for Timor-Leste, all belong to the Association of South-East Asian Nations, or ASEAN, headquartered in Jakarta, Indonesia.

Recent research has introduced key themes and trajectories in the study of South-East Asian modern architecture which emphasized the region's diverse modernities (Setiadi Sopandi et al., 2017). Likewise, the mASEANa project underscores the importance of regional documentation initiatives and their dual role in promoting the appreciation of modern architecture across South-East Asia and encouraging positive conservation action (Hayashi et al. 2024). Against this backdrop, the HTF's focus on themes that cut across borders and national narratives similarly allows for relating and comparing a diversity of industrial heritage sites: tin mines in Malaysia, textile mills in Viet Nam, railroads in Indonesia, or oil infrastructure in Brunei Darussalam. Each tells a story not just of local development but also of regional transformation, often under the influence of global trade, colonisation, and Cold War geopolitics.

The HTF thus helps situate these experiences within broader global patterns. In addition to enabling comparative analysis, the HTF can also serve as an inspiration for identifying underrecognised or yet-to-be-documented sites of potential heritage value across the region.

The tool does so by helping us to move beyond the monumental toward the everyday, specifically by recognising worker housing, industrial railways, and warehouses as critical to shaping human experience in the 20th century - a time when industrial activities escalated to a global scale and profoundly influenced daily life and social structures. The HTF also supports a diverse understanding of heritage sites, something directly relevant

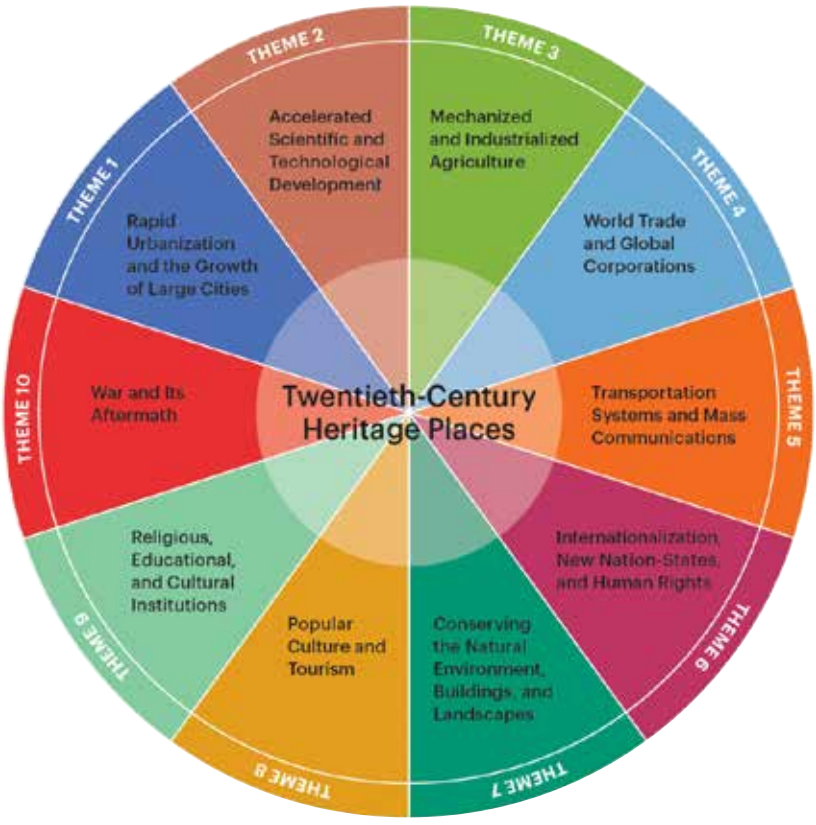


Figure 1:
Diagram of the HTF from The Twentieth-Century Historic Thematic Framework: A Tool for Assessing Heritage Places (2021). © 2021 J. Paul Getty Trust. Source: Marsden, Susan, and Peter Spearritt. 2021. *The Twentieth-Century Historic Thematic Framework: A Tool for Assessing Heritage Places.* With contributions from Leo Schmidt, Sheridan Burke, Gail Ostergren, Jeff Cody, and Chandler McCoy. Los Angeles: Getty Conservation Institute

to the evaluation of their adaptive reuse potential, which is essential in South-East Asia where development pressures threaten many industrial-era sites. The successful transformation of sites like Singapore's former colonial-era St. James Power Station into the headquarters of the Dyson corporation demonstrates how industrial structures can evolve while trying to navigate its cultural significance. Conducting thematic studies across South-East Asia poses practical challenges. Many sites lack documentation, and public awareness of their historical significance is limited. National agencies often have their own frameworks for conducting heritage assessments, such as the Philippines' National Commission for Culture and the Arts' "Rubrics of Cultural Significance for Built Heritage", which could, for example, refer to the HTF principles to enhance harmonisation.

Ten Twentieth-Century Themes

The HTF identifies ten major themes relevant to 20th-century development, which are:

Theme 1: Rapid Urbanisation and the Growth of Large Cities

In post-World War II South-East Asia, industrialisation catalysed rapid urban growth. Singapore's industrial estates and housing projects and Kuala Lumpur's Petronas Towers exemplify how urban planning and corporate ambition shaped new skylines. These cities reflect a deliberate effort to use architecture and infrastructure as signals of modernisation and national progress.

Theme 2: Accelerated Scientific and Technological Development

Foreign investment and technology transfer played vital roles in South-East Asia's development. For example, the intensified development of military cantonments in preparation for World War II gave impetus to the transfer of novel building typologies and technology from Europe to South-East Asia, such as the large-span steel workshops of the Singapore Naval Base. Vietnam's power stations were shaped by Soviet and Chinese aid, while Thailand's automotive sector benefited from Japanese investment. Technologies imported from Europe and the U.S. transformed everything from production to communication.

> "The HTF thus helps situate these experiences within broader global patterns. In addition to enabling comparative analysis, the HTF can also serve as an inspiration for identifying underrecognised or yet-to-be-documented sites of potential heritage value across the region.

Theme 3: Mechanized and Industrialised Agriculture

Between 1950 and 2000, the proportion of South-East Asians working in agriculture fell from 76% to 41%, reflecting mechanization and industrial growth. In some cases, the industrialisation was not complete, and the HTF helps us examine this.



Figure 2: St James Power Station, Singapore. Photograph by Westliche. Source: Wikimedia Commons, CC BY-SA 4.0

Indonesia's rubber estates, Malaysia's palm oil plantations, and the Philippines' sugar plantations are agrarian sectors that were transformed into industrial systems, but only up to a point, because in spite of the integration of mechanized processing of the raw material and its transportation, there remained a heavy dependence on manual labour in obtaining the raw material.

Theme 4: World Trade and Global Corporations

Colonialism in South-East Asia spurred the development of a global network of trading ports and their attendant infrastructure of docks, warehouses, and railways. The integration of South-East Asia into global markets accelerated through export-oriented development. Special economic zones in Malaysia and Thailand, as well as Singapore's ports, facilitated multinational corporate activity. The "tiger cub economies" of Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam followed the high-growth models of Asia's Four Tigers: Taiwan Province of China, Hong Kong SAR China, Singapore, and the Republic of Korea.

Theme 5: Transportation Systems and Mass Communications

Infrastructure expansion was essential to South-East Asia's industrial development. Malaysia's railway network, developed under British rule, connected plantations and mines to ports. As air travel became vital, cities built new international airports linked by express rail, reflecting the growing importance of global mobility. These systems enabled the rapid movement of goods and people, cementing the region's integration into global markets.

Theme 6: Internationalisation, New Nation-States, and Human Rights

Post-independence development was shaped by political ideology and international alliances. Viet Nam, Lao DPR, and Cambodia were reshaped by communist revolutions, while Indonesia and Malaysia sought a middle path via the Non-Aligned Movement. Nation-building efforts often included ambitious infrastructure development programmes tied to a search for new urban and architectural visions that expressed a sense of optimism and identity of new nation-states.

Theme 7: Conserving the Natural Environment, Buildings, and Landscapes

As heritage tourism gained prominence, South-East Asian cities began restoring historical districts to generate economic and cultural value. The rehabilitation of Singapore shophouses since the 1980s illustrates how preservation can align with development. Industrial sites, once seen as obsolete, are increasingly recognised as assets for education, tourism, adaptive reuse and as a focus of regeneration.

Theme 8: Popular Culture and Tourism

There is a growing interest in industrial heritage sites like historic railways, factories, and ports as cultural attractions, balancing tourism demand with conservation to protect their historical, technological, and cultural significance. Repurposed heritage sites reflect the role of architecture in shaping regional identity and attracting international visitors. Industrial development under state-funded programmes often incorporates strategic sites to showcase and market the estates to foreign dignitaries and investors, such as the Jurong Hilltop Gardens and Tower in Singapore. These are also ceremonial and symbolic sites that embody aspirational values, featuring in popular culture such as films and magazines.

Theme 9: Religious, Educational, and Cultural Institutions

Industrialisation required a skilled labour force. Governments expanded technical education and vocational training to meet this need. In countries like the Philippines, the continued prominence of Catholic institutions also shaped educational development. Across the region, universities and polytechnics played a crucial role in upskilling the workforce.

Theme 10: War and Its Aftermath

South-East Asia's industrial heritage cannot be understood without acknowledging war's impacts. The Viet Nam War destroyed large tracts of forest and infrastructure. In Cambodia, the Khmer Rouge decimated industrial capacity. Indonesia's independence struggle and subsequent conflicts likewise affected economic planning and resource allocation. Nascent nationalism after World War II accelerated the process of decolonisation, along with the adaptation of the military-industrial infrastructure for civilian use. For example, the Singapore Naval Base conversion into the Sembawang Shipyard played a pivotal role in the economic survival of the newly independent nation-state.

> **"Today, many industrial sites in South-East Asia remain underused, neglected, or at risk of demolition. Yet these places embody stories that resonate beyond their walls. Identifying, interpreting and preserving them through frameworks like the HTF helps ensure that the material and social history of South-East Asia's industrial past is not lost, but instead reimagined as part of its future.**

Exploring the Use of Thematic Assessments: Scope, Relevance, and Application

In light of these ten themes, we can consider as a case study *the Sugar Cultural Landscape of Negros and Panay Islands* in the Philippines, which now sits on the UNESCO World Heritage Tentative List. For *the Sugar Cultural Landscape of Negros and Panay Islands,* Theme 4 (World Trade and Global Corporations) would be directly applicable, as the region's sugar production has long been tied to global trade, particularly during the Spanish and American colonial periods. The sugar plantations of Negros and Panay played an integral role in the international sugar market.

Theme 5 (Transportation Systems and Mass Communications) would address the infrastructure that facilitated this trade, such as railroads and ports that supported the expansion of the sugar industry and its export networks.

Sugar mills showcased technological advancements in sugar production. Staff quarters reveal the social hierarchies and labour conditions of the time, while religious buildings highlight the region's spiritual and communal values. These structures illustrate the interplay between architecture, economy, and culture. For example, the structures that the Czech-American architect Antonin Raymond designed for Victorias Milling Corporation in Negros Occidental include



Figure 3: Photograph of the Sanctuary and Angry Christ mural at St. Joseph the Worker Parish Church, Victorias. Photograph by Dominic Galicia. CC-BY-SA 3.0 IGO

the Saint Joseph the Worker Parish Church. It is commonly known as the Angry Christ Church because of a mural created by Alfonso Ossorio, a son of the owners of Victorias.

This is a site that adds piquancy to Theme 9 (Religious, Educational, and Cultural Institutions).

These sugar-linked sites—industrial complexes, chapels, urban buildings, and transport systems—demonstrate how the Twentieth-Century Historic Thematic Framework can bring coherence to diverse heritage elements, enabling the interpretation of key sugar industry sites under thematic categories, as well as evaluation of their value and recommendation of conservation strategies.

Today, many industrial sites in South-East Asia remain underused, neglected, or at risk of demolition. Yet these places embody stories that resonate beyond their walls. Identifying, interpreting and preserving them through frameworks like the HTF helps ensure that the material and social history of South-East Asia's industrial past is not lost, but instead reimagined as part of its future.

References:

Hayashi, Kengo., Muramatsu, Shin., Yamana, Yoshiyuki., Johannes Widodo, (eds), mASEANa: Appreciating modern ASEAN architecture, Tokyo: Docomomo Japan, 2024. Retrieved from https://www.maseana.iis.u-tokyo.ac.jp/ebook/#features/

ICOMOS International Scientific Committee on 20th Century Heritage, Approaches to the Conservation of Twentieth-Century Cultural Heritage: Madrid-New Delhi Document, 2017. Retrieved from https://isc20c.icomos.org/resources/mndd/mndd-full-document-translations/

ICOMOS International Scientific Committee on 20th Century Heritage, The Cadiz Document: InnovaConcrete Guidelines for Conservation of Concrete Heritage, Valencia: La Imprenta, 2021. Retrieved from https://isc20c.icomos.org/policy_items/complete-innovaconcrete/

Marsden, and Spearritt, Peter, et al., The Twentieth-Century Historic Thematic Framework: A Tool for Assessing Heritage Places, Los Angeles: Getty Conservation Institute, 2021. Retrieved from https://www.getty.edu/conservation/publications_resources/pdf_publications/twentieth_century_historic_thematic_framework.html

Setiadi Sopandi, Yoshiyuki Yamana, Johannes Widodo, Shin Muramatsu (2017). 'Modern Architecture in Southeast Asia, an Introduction. Asia, North-South-West-East', Docomomo International Journal, Issue 57, 2017/2. Retrieved from https://docomomojournal.com/index.php/journal/article/download/292/176/179

5

National Reports and Selected Sites

Indonesia

Contributors:

Dr. Maya Rosa
Architect, Lecturer and Researcher
ICOMOS Indonesia

Hasti Tarekat
Founder
Heritage Hands-on

Industrial Heritage in Indonesia: A National Summary

The industrial heritage of Indonesia extends far beyond factories, mines, workshops, and transport infrastructures. It embodies a long historical continuum shaped by precolonial maritime polities, the mechanized industries of the colonial era, and the diverse transformations that followed independence. In Indonesia, industrial heritage is approached not simply as a collection of tangible artefacts, but as a cultural landscape animated by communities, knowledge traditions, ritual practices, and social arrangements that evolved over centuries. This broader understanding aligns with ongoing regional and international conversations, including recent exchanges among South-East Asian industrial heritage experts and National Writers involved in the present study under the coordination of UNESCO Bangkok and TICCIH. Indonesia's national framework also draws upon the conceptual foundation set out in The Nizhny Tagil Charter for the Industrial Heritage (TICCIH, 2003). The Charter emphasizes that industrial heritage encompasses the physical remains of industrial culture as well as the social, technological, and cultural systems through which industrialisation shaped human lives. This mirrors Indonesia's emphasis on industrial heritage as a socially embedded and culturally constructed landscape that integrates tangible, intangible, and living dimensions.

In the regional discussions that unfolded in the framework of this thematic study, Indonesia's experts in industrial heritage have highlighted the need to reframe industrial heritage by reconsidering it through a longer historical arc. Rather than beginning with colonial industry, the Indonesian narrative foregrounds pre-colonial systems of production, exchange, and craft knowledge. These early traditions laid important foundations for later industrial developments and continue to inform community life and identity up to the present day. By adopting this perspective, Indonesia positions its industrial heritage as a dynamic, living domain rather than a static archive. This approach resonated strongly during the recent South-East Asian regional meeting, which was organised as part of this study in July 2025, and brought together researchers, heritage practitioners, and governmental actors from

eight countries. Across the region, there is growing recognition that industrial heritage forms an essential part of cultural history, sustainable development, and community resilience.

In Indonesia, many industrial landscapes remain inhabited and actively interpreted by their communities. These local custodians provide site-based knowledge essential for understanding how industrial systems evolved and how their legacies might be managed today. A long historical view is particularly important for Indonesia because the roots of its industrial heritage reach deep into the pre-colonial era. Maritime polities such as Srivijaya (Sriwijaya), Majapahit, Ternate, and Tidore developed intricate systems of production and distribution. Srivijaya's prominence in maritime trade connected the archipelago to South Asia, China, and the Middle East. Although these systems were not "industrial" in the modern mechanised sense, they included advanced forms of resource management, shipbuilding, craft production, and port organisation. Agricultural innovation, metalworking, irrigation systems, and specialised maritime hubs evolved across islands, forming the foundations for later industrial expansion. These patterns reveal long-standing technological agency, cultural adaptability, and regional connectivity that predate European involvement.

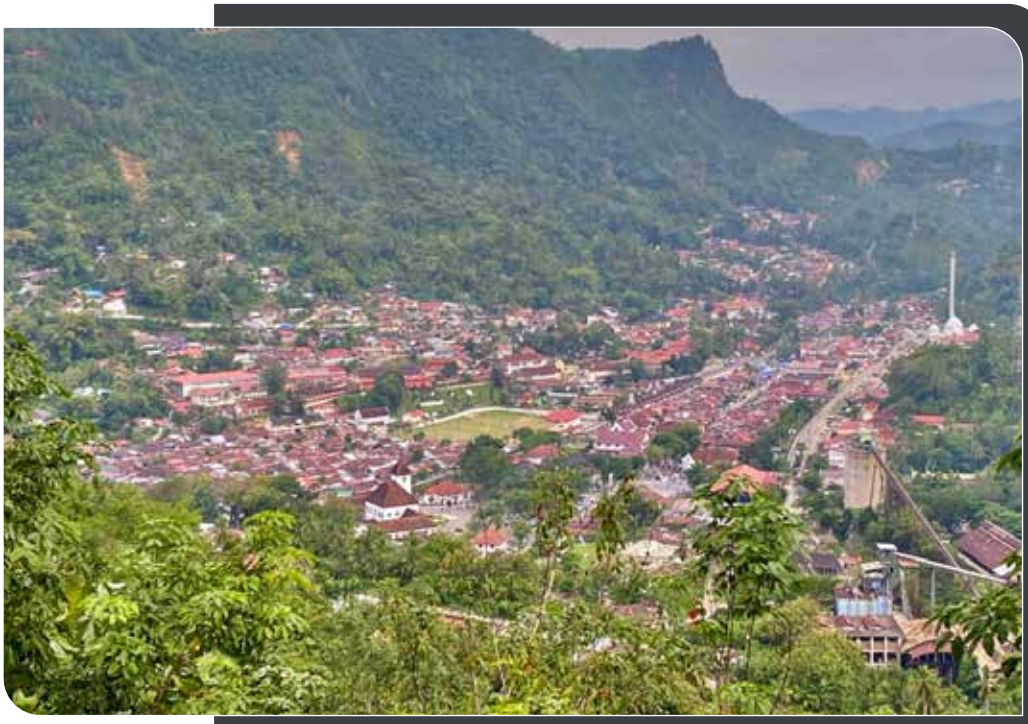


Figure 1: Aerial view of Sawahlunto Indonesia, as the administrative mining town of the *Ombilin Coal Mining Heritage of Sawahlunto* (OCMHS), a World Heritage Site. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO)

The most intensive phase of mechanized industrialisation emerged during Dutch colonial rule. Investments in plantation agriculture, mining, transportation, and port infrastructures dramatically altered Indonesian landscapes. In Java, the sugar industry developed into one of South-East Asia's most extensive industrial networks. Hundreds of mills operated

with imported machinery, research laboratories, worker housing, and integrated transport systems. Railways, warehouses, and bridges reshaped rural and urban environments, leaving spatial patterns that still remain visible today. Mining complexes offer another layer of this legacy. *The Ombilin Coal Mining Heritage of Sawahlunto*—South-East Asia's first now Indonesia's only industrial site on the UNESCO World Heritage List—illustrates the sophistication of colonial industrial planning. Its network of tunnels, power stations, railways, and settlements formed a fully integrated operational landscape, reflecting both technological ambition and colonial labour structures. Similar patterns emerged in Bangka, Belitung, and other mineral-rich regions of Indonesia.

Bandung contributed to this industrial story through its role as a centre of technical education and experimentation. The establishment of the *Technische Hoogeschool te Bandoeng* strengthened local expertise in engineering and architecture, feeding into broader colonial industrial networks. Across the archipelago, colonial industry left a complex legacy of factories, offices, warehouses, and transport infrastructures, but it also generated cultural practices, labour histories, and community memories that remain vital to Indonesia's identity. After independence, Indonesia undertook significant nationalisation and modernisation efforts. Over time, new sectors such as energy, textiles, and automotive manufacturing expanded. Some colonial infrastructures were repurposed, while others fell into disuse. These shifts produced uneven industrial landscapes where modern facilities coexist with historic structures and longstanding communities rooted in older industrial systems.

The country's industrial heritage is therefore characterised by overlapping temporal layers: pre-colonial networks, colonial infrastructures, and post-independence transformations. Understanding this heritage requires attention to both tangible and intangible dimensions. Physical evidence includes mills, canals, mines, ports, laboratories, transport corridors, and worker settlements. Yet, these structures derive much of their meaning from the practices and memories that surround them. Rituals such as the Cembengan ceremony in sugar-producing areas illustrate how industrial cycles are embedded in local cultural life. Oral histories, labour traditions, festivals, and everyday uses of space continue to animate many industrial landscapes. This vitality reinforces the need for conservation strategies that recognise communities as custodians and interpreters rather than passive observers.

A cultural landscape approach provides an effective framework for integrating the multiple layers of Indonesia's industrial heritage. This approach situates industrial sites within broader ecological, social, and spatial systems, acknowledging the interdependence of production, labour, community, and environment. It also aligns with UNESCO's frameworks for appreciating the long-term human environment interactions that shape cultural landscapes. By adopting this perspective, Indonesia can pursue conservation strategies that address ecological sustainability, community needs, and historical integrity in a holistic manner. During the July 2025 Regional Discussion, Indonesia outlined

several key industrial heritage loci to be developed further within the national thematic study. These include Palembang, Barus, Sawahlunto, Bandung, Medan–Deli, the sugar-producing regions of Central and East Java, Sumenep, Indarung, Lasem, and emerging industrial landscapes such as Rumah Atsiri. These sites reflect diverse typologies, from maritime trading systems and Islamic commercial routes to colonial extraction zones and modern industrial complexes.

Rather than producing a simple inventory of sites, the thematic study aims to map regional connections, highlight community narratives, and trace the evolution of industrial knowledge across time and space. Possible outcomes could also consist of an online industrial heritage database and generally resources and research material laying the groundwork needed to inform potential future nominations to the UNESCO World Heritage List. The study underscores the need for stronger coordination among Indonesian government agencies responsible for heritage protection, including those managing inventories, designation processes, and conservation planning. It offers an opportunity to enhance collaboration with local governments, researchers, and communities while supporting long-term policy development.

Despite its richness, Indonesia's industrial heritage faces significant challenges. Rapid urbanisation, redevelopment pressures, and insufficient regulatory protections threaten many sites. The lack of a comprehensive national inventory leaves important industrial heritage sites and landscapes unrecognised and underappreciated. Intangible and living heritage elements, such as rituals and oral histories, are at risk of disappearing as communities change or relocate. Addressing these vulnerabilities requires deliberate documentation, community engagement, and integrated policy frameworks. By recognising industrial heritage as a complex cultural landscape shaped over centuries, Indonesia is well-positioned to strengthen its conservation efforts and contribute meaningfully to global heritage discourse. Safeguarding this heritage is essential not only for preserving the past, but also for imagining sustainable and culturally grounded futures.

Transnational Connections

Indonesia's industrial heritage reflects long-standing transnational connections with a wide range of countries across Asia, Europe, and beyond. In the precolonial period, commercial and cultural links tied the archipelago to China, India, Sri Lanka, Arabia, Persia, and later Portugal and Spain through maritime trade. During the colonial era, industrial development was shaped primarily through connections with the Netherlands. In the post-independence period, industrial collaborations and supply chains expanded to include Japan, Republic of Korea, China, and Australia, as well as continued regional ties within ASEAN. These countries collectively shaped Indonesia's transportation networks, trade systems, technological exchanges, and industrial growth across different historical periods.



Figure 2: Façade of the Dutch-colonial era sugar factory in Banjaratma after its adaptive reuse as a rest area. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

National Inventory or database for the country's built heritage

There is also a documentation of 20th century heritage of the city of Jakarta published by DOCOMOMO Japan, which includes industrial heritage buildings. The publication is entitled *mASEANa: Appreciating modern ASEAN architecture*. This publication is available online: https://www.maseana.iis.u-tokyo.ac.jp/phone/book.html

National System of Statutory Protection for Built Heritage and the Inclusion of Industrial Heritage

Indonesia has a statutory protection system for built heritage established through Law No. 11/2010 on Cultural Heritage, which provides the legal basis for the designation and protection of cultural properties at national, provincial, and municipal levels. This framework is strengthened by the Ministry of Education, Culture, Research, and Technology Regulation No. 14/2022 on Standards for Cultural Heritage Conservation, which sets technical guidelines for documentation, preservation, and management in accordance with national and international conservation principles. There is no system of statutory protection for industrial heritage specifically.

Sustainability of the Recognised Industrial Heritage Assets and their Contribution to the SDGs

Particular SDGs are connected with the protection of industrial heritage. First is SDG 11, especially 11.4, by safeguarding cultural heritage within urban environments. Second is SDG 8, particularly 8.9, through community-based industrial heritage tourism that creates local employment. Third is SDG 13 for adaptive reuse where protecting industrial heritage reduces embodied carbon and demolition waste. It also strengthens SDG4 as hands-on learning environments for design, architecture, engineering, and heritage studies. It connects with SDG 12 through responsible cultural tourism, and SDG 17 via partnerships among governments, universities, communities, and international network.

Barus

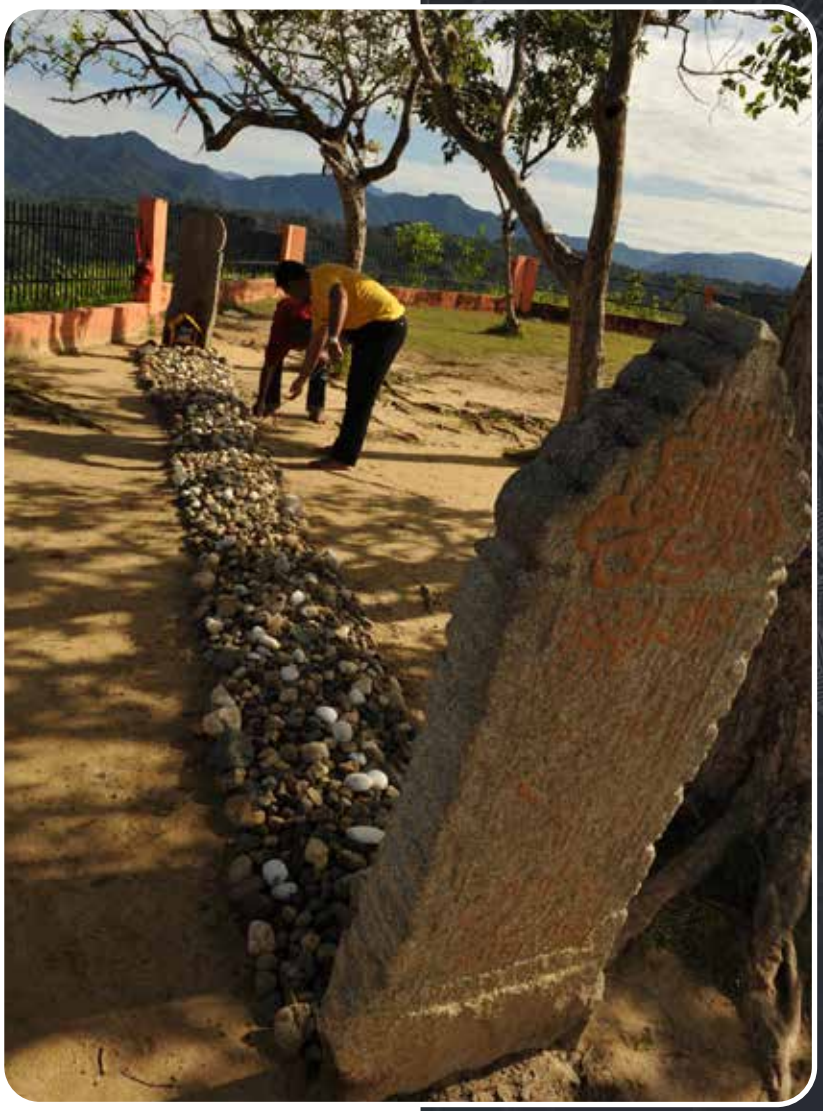


Figure 1: Makam Papan Tinggi. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Contributors:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

Wani Maler
Faculty of Humanities,
Univesitas Andalas

State, Province, Region
Indonesia, North Sumatra, Central Tapanuli Regency,

Industrial Designation
Barus, located in North Sumatra, Indonesia, is not yet officially internationally recognised as significant.

Industrial Classification
Forest Industries

Further Details on the Industrial Classification
Barus played an important role in early global trade, renowned for its camphor, a highly valued commodity in medicine, ritual, and spirituality. This resource connected Barus with India, China, the Middle East, and later Europe, making it a hub of exchange.

Brief description

The trading of camphor also shaped Barus as a cultural crossroads. Historical and archaeological evidence indicates that Barus was among the earliest gateways of Islam into the Indonesian archipelago. Muslim merchants from the Middle East, India (particularly Gujarat), and Persia began arriving between the 7th and 9th centuries CE, drawn to Barus by the lucrative trade in camphor, a commodity prized for medicine, ritual, and spirituality. By the 12th century, Barus had become a thriving cosmopolitan hub with firmly established Muslim communities.
This legacy is reflected in its historic cemeteries, considered the oldest Islamic tombs in Southeast Asia: makam Mahligai, makam Papan Tinggi, makam Tuan Ibrahimsyah, makam Machdum, makam Tuan Ambar. Nowadays, it is difficult to find trees of Barus camphor. According to a native ulama, a custodian of local customs and Islamic norms, there are Barus camphor in the forest. It is difficult to find trees of Barus camphor. Sometimes, people find them when they look for wood.

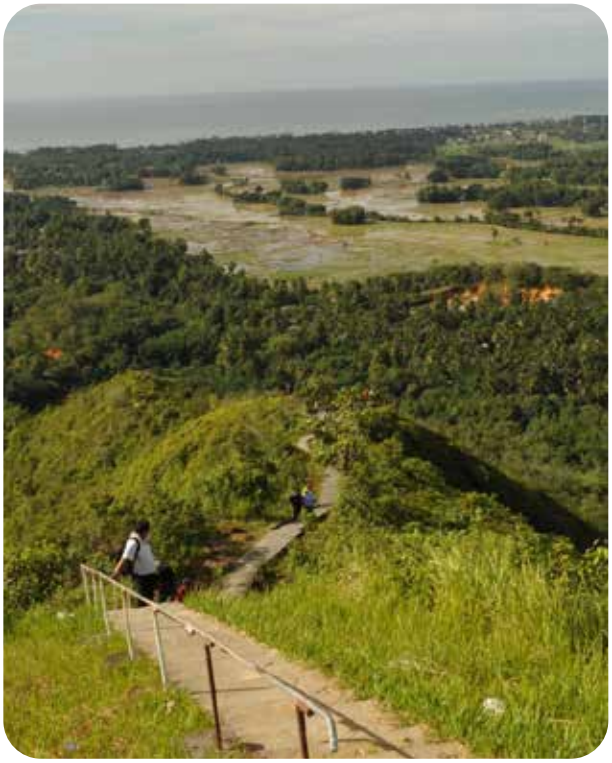


Figure 2: Famous 700 stairs lead to Makam Papan Tinggi. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Aside from the use of camphor in Barus, the tradition of stone carving, particularly in the making of Islamic gravestones, represents an important form of intangible cultural heritage in the town. As Islam spread widely into the region from the 12th century onwards, local craftsmen developed skills to create gravestones that combined artistic expression, religious symbolism, and cultural identity. The continuity of this craft illustrates the blending of faith, tradition, and local heritage.

Period(s) of operation

The trading of camphor in Barus spanned multiple historical phases. Its earliest operations trace back to the first millennium CE, when Barus was noted in Indian and Chinese records as a vital exchange port. During the Islamic period (12th–15th centuries), Barus thrived within the Indian Ocean trade, linking Sumatra to Middle Eastern markets. In the colonial era (16th–19th centuries), Portuguese and Dutch traders highly prized camphor for medical, ritual, and industrial purposes.

Barus, long renowned for its camphor trade, became a significant centre during the early Islamic period, as evidenced by the Lobu Tua inscription written in the Tamil language, which identified Lobu Tua as the capital of Barus and the site of camphor cultivation. Tamil traders were also active in the region, linking Barus to broader Indian Ocean networks. However, unsustainable practices, such as failing to replant camphor trees and difficulties distinguishing resin-producing trees, led to decline. By the 13th century, the once-thriving town grew quiet. This downturn was further exacerbated by a devastating tsunami around the 1200s, as noted in archaeological studies.



Figure 3: Old Camphor Tree. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Status of the research and historical documentation
Although camphor trading in Barus has been explored through political economic historiography, Islamic and textual studies, maritime network analysis, archaeological research, and theoretical interpretations, these perspectives remain largely separate. As a result, they have not yet formed a coherent industrial heritage discourse. This leaves the material systems of production, related landscapes, technologies, and long-term socio-economic effects in Barus insufficiently explained within industrial heritage studies.

Current status and state of conservation
The burial complex is already registered on the national cultural heritage list. Despite numerous studies and research conducted by Indonesian and international researchers, Barus' conservation efforts have not yet been recognised internationally.

Known threats
Barus faces threats to its tangible and intangible heritage. The failure to replant camphor trees erased a vital resource and tradition. Harsh climate and coastal erosion damage landscapes and ancient tombs. Located on Sumatra's exposed west coast, Barus remains vulnerable to tsunamis and earthquakes, highlighting the urgent need for conservation and risk mitigation efforts.

Protection status
Since 2022, camphor tree nursery and replanting have begun. Barus also holds strong potential for religious tourism, with historic cemeteries and multiethnic heritage.

Registration status in the national or local inventory
The cemetery complex has been registered on the national cultural heritage list.

Ownership
Barus stakeholders include local communities, religious leaders, regional government (North Sumatra and Central Tapanuli).

Deli Tobacco Hospital



Figure 1: Main Building Entry. Photograph by Beranda Warisan Sumatra (2020). CC-BY-SA 3.0 IGO

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect and Researcher

Shindi Indira
ICOMOS Indonesia
Member

State, Province, Region
Indonesia, North Sumatera, Medan

Industrial Designation
The site is documented in the Industrial Heritage Inventory of the Asian Network of Industrial Heritage (ANIH) as part of a regional effort to identify and record places associated with the development of industrial culture. Available at https://anih.culture.tw/index/en-us/inventory/94282

Industrial Classification
Industrial Communities

Further Details on the Industrial Classification

Also known as the Deli Mij Hospital, the hospital, established around 1900 by Deli Maatschappij, was integral to the colonial plantation system, serving both healthcare and industrial needs. With 600 beds, modern facilities like X-ray and operating rooms, and specialized infectious wards, it showcased advanced medical infrastructure for the time. Its integration with transport and plantations highlights its dual role in safeguarding workers' welfare, preventing disease, and maintaining labour productivity.

Brief description

The former Deli Maatschappij Hospital, established around 1900 in Medan, was one of the largest colonial-era medical complexes in Sumatra, with a capacity of approximately 600 beds. Its tangible attributes include pavilions for different wards, an operating theatre, X-ray department, isolation units for infectious diseases, staff housing, and landscaped surroundings connected to the nearby tobacco plantations. Originally serving plantation workers and the colonial community, the hospital later functioned as a public health facility, reflecting changing medical and social roles. Intangible attributes include its association with the plantation economy, colonial health management practices, and the introduction of Western medical technologies in Sumatra. It embodies the cultural interaction between Dutch medical systems and local traditions, while also reflecting the social history of labour, disease prevention, and community welfare in the plantation landscape.

Period(s) of operation

The Deli Maatschappij Hospital began operation around 1900 during the peak of the tobacco plantation industry in East Sumatra. Initially, it served primarily as a medical facility for plantation workers and European staff. After the Indonesian independence era, it became a general hospital under the management of the Indonesian Plantation Company (PTP IX, and then PTP II), until it ceased operation in 2011.



Figure 2: PTPN Clinic. Photograph by Beranda Warisan Sumatra (2020). CC-BY-SA 3.0 IGO

During its operation, the hospital underwent notable changes reflecting wider historical shifts. Initially built ca. 1900 as a colonial plantation hospital for European staff and workers, it expanded with modern facilities such as operating theatres, X-ray units, and specialized wards, marking the introduction of advanced medical technology in Sumatra. After Indonesian independence, the hospital transitioned from a company-owned facility to a public institution, broadening access for local communities. This change in function—from industrial support infrastructure to civic healthcare—illustrates the transformation of colonial medical heritage into a national public resource. Architecturally, while some pavilions and wards have been altered or repurposed, the overall layout and landscape relationship to the plantation context remain discernible, preserving its historical significance.



Figure 3: Main Building. Photograph by Beranda Warisan Sumatra (2020). CC-BY-SA 3.0 IGO

From an industrial heritage perspective, the hospital represents an integral component of the wider plantation production system, embodying the technological, social, and institutional dimensions of colonial industry. Its surviving buildings, spatial organisation, and landscape setting convey the historical relationship between industrial enterprise, labour welfare, and medical practice. At the same time, its continued use underscores the adaptive capacity of industrial heritage as a living resource within contemporary society.

Status of the research and historical documentation

Early documentation dates from 1905–1915 ca, with KITLV and Tropenmuseum photographs as well as colonial medical reports describing the hospital as having approximately 600 beds and being established 'around 1900'. Concise summaries also appear in the Historical Hospitals database. Academic writings address the hospital's role within the plantation system, highlighting advanced facilities for its time, such as an operating theater, X-ray machines, and a dedicated infectious diseases ward. An Indonesian architectural study offers differing dates, suggesting it was initially established in 1885 and finally closed in 2008, creating a chronological discrepancy that requires further reconciliation. Documentation exists in Dutch, English, and Indonesian, with published articles, encyclopedic references, and a large unpublished photographic archive held in institutional digital collections. Records are dispersed in Dutch institutions: photographic evidence is well-preserved in the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV), Tropenmuseum, and the Nationaal Archief; company files and colonial health reports are catalogued but scattered across several Dutch repositories, which have only been partially digitised.

Current status and state of conservation

Today, the former Deli Maatschappij Hospital no longer serves its medical function. Several pavilions and auxiliary buildings survive, though many are altered, repurposed, or neglected. Its original equipment is gone, while some structures preserve their layout and architecture. The site is thus only partially intact: it no longer operates as a hospital but remains a tangible link to industrial-medical heritage, with selected buildings adapted as a Tobacco Gallery and Lounge.



Figure 4: Hospital Ward IIB. Photograph by Beranda Warisan Sumatra (2020). CC-BY-SA 3.0 IGO

Known threats
Weather and patterns of reuse that do not necessarily align well with the historic values and function of the site.

Protection status
Designated as cultural heritage of Medan City by the Mayor of Medan and monitored by the Medan City Education and Culture Office.

Registration status in the national or local inventory
Deli Tobacco Hospital has been designated as a cultural heritage site of Medan City (No. 433 of 2021).

Ownership
Since independence, the company's owner has been PTPN IX, and subsequently changed to PTPN II. PT Nusa Dua Propertindo now manages it.

Dutch Colonial-Era Sugar Factories



Figure 1: The old brick remains. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

State, Province, Region
Indonesia
Central and East Java Provinces

Industrial Designation
At present, no Dutch colonial-era sugar factories in Indonesia have been formally inscribed on the UNESCO World Heritage List. Nevertheless, several sugar mills and associated colonial infrastructures have been referenced in international thematic studies on industrial heritage, which highlight their cultural and historical value within the broader context of industrial heritage. At the national level, Indonesia has undertaken significant efforts to inventory and safeguard colonial industrial heritage, including sugar production sites, by recognising them as national cultural properties and potential candidates for future international heritage nominations and protection programmes.

Industrial Classification
Food & Drink Processing

Brief description
Sugar industrial heritage is directly linked to the cultivation of sugarcane, with large-scale processing industries developed during the Dutch colonial period. The characteristics of these sites go beyond factory buildings, encompassing plantation fields, irrigation systems, railway networks, warehouses, and workers' housing that together formed an integrated agricultural industrial landscape.

Tangible Attributes
The Dutch colonial-era sugar factories comprise a wide range of tangible elements, including factory complexes with milling halls, steam engines, boilers, warehouses, and chimneys, alongside plantation fields, irrigation canals, railway tracks, bridges, and workers' housing. Originally established for the cultivation and processing of sugarcane under the colonial economy, many of these functions have evolved—some factories remain operational, while others stand as historic landmarks.

Intangible Attributes
The heritage of these sites also includes intangible aspects such as traditional skills of sugarcane cultivation, milling techniques, and maintenance of steam-powered machinery, as well as community traditions related to the beginning of the production time, cultural memory, and oral histories that continue to connect local people to the sugar industry's legacy.

Period(s) of operation
Dutch colonial-era sugar factories in Indonesia emerged in the early 19th century and grew rapidly during the Cultivation System (1830–1870), when sugarcane was enforced as a cash crop. They peaked in the late 19th and early 20th centuries with steam technology and railway support. After 1945, many continued under state or private ownership but declined in the late 20th century. Today, many have been partially conserved, while others have been adaptively reused as rest areas and cultural venues.



Figure 2: The interior of Banjaratma. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

The early 19th century, under colonial administration, was marked a decisive change in land use, as large areas of fertile farmland were converted into sugarcane plantations. The introduction of the Cultivation System represented a profound socio-economic shift, as rural communities were compelled to grow sugarcane as a compulsory crop, reshaping local economies and labour relations. In the late 19th and early 20th centuries, factories underwent technological modernisation, including the installation of steam-powered machinery, new milling techniques, and the construction of railway networks to transport sugar. These advances significantly altered the physical attributes of the sites, with large chimneys, processing halls, warehouses, and workers' housing added to the landscape. After 1945, many factories were nationalised, symbolising a shift from colonial exploitation to national ownership. However, economic changes in the late 20th century led to closures, abandonment, or adaptation of several sites.



Figure 3: The old machine left. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

Status of the research and historical documentation

Research and documentation of Dutch colonial-era sugar factories in Indonesia began in the late 19th century through colonial business records, maps, and engineering drawings produced by the Dutch East Indies administration and private companies. Major sources include company archives, production logbooks, and architectural plans preserved in the Nationaal Archief, The Hague, and the National Archives of Indonesia. Recent academics explored a lot of adaptive reuse. Records such as photographs, technical catalogues, and factory logbooks exist in both Dutch and Indonesian repositories.

Current status and state of conservation

The condition of Dutch colonial-era sugar factories in Indonesia varies widely. Several remain operational, particularly in Central and East Java, retaining milling halls, chimneys, warehouses, and even original steam-powered machinery, often integrated with modern equipment. Others are partially ruinous, with deteriorating structures and abandoned ancillary facilities such as railways and workers' housing. Some have been adaptively reused as cultural venues, rest areas, or community spaces.

Known threats

Dutch colonial-era sugar factories face multiple threats, including structural decay, machinery corrosion and loss, uncontrolled vegetation, and loss of ancillary features such as workers' housing and railway lines. Urban expansion and industrial modernization also risk demolition or insensitive alteration. Limited funding and awareness hinder preservation. Measures include designation as local cultural heritage, adaptive reuse projects, and local initiatives promoting awareness.

Protection status

Several factories are designated as Cagar Budaya under Indonesia's Heritage Law No. 11/2010, providing legal protection, conservation guidelines, and integration into regional spatial planning for immediate sites and surrounding landscapes.

Several Dutch colonial-era sugar factories are included in Indonesia's National Cultural Heritage Database and in regional heritage registers of Central and East Java. These entries record their history, architecture, and status, supporting conservation and reuse planning.

Ownership

Many factories belong to state-owned enterprises PT Perkebunan Nusantara (PTPN), some to private companies, and others to local governments or communities, creating complex management challenges for heritage conservation.

Lasem



Figure 1: Batik Crafters. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Contributors:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

Fey Poetri
ICOMOS Indonesia
Member

State, Province, Region
Indonesia, Central Java

Industrial Designation
Lasem, Indonesia, is not yet internationally recognised. Due to its long history as a Javanese coastal trading hub with significant Chinese, Arab, and European influences, Lasem is widely acknowledged by heritage experts as a potential candidate for international listing, especially for its tangible and intangible heritage integration within a living historic town.

Industrial Classification
Textiles

Batik Lasem represents a distinctive category within Indonesia's textile heritage, reflecting deep cultural exchanges between Javanese and Chinese traditions. Its motifs, such as dragons, phoenixes, and coastal flora, demonstrate Lasem's position as a vibrant maritime trade hub. The bold use of red, achieved through unique dyeing techniques, sets it apart from other batik traditions.

Brief description

Lasem is historically recognised as one of Java's most important coastal towns, with tangible attributes that include its traditional batik workshops, historic Chinese-style houses, old trading warehouses, colonial-era buildings, and its proximity to the port that once connected it to international trade routes. These component parts reflect Lasem's function as both a production centre and a trading hub, which has shifted from maritime commerce to batik industry as a primary livelihood. Its relationship with the local community is embedded in everyday life, where houses double as spaces of production, and the town's landscape reflects centuries of cultural interaction between Javanese, Chinese, and colonial influences. Historically, Lasem is significant as one of the earliest settlements of Chinese migrants in Java and as a centre of cultural exchange and resistance during colonial times.

The intangible attributes of Lasem include the skills and technologies of batik-making, particularly its famous Batik Lasem Merah (red batik), achieved through unique dyeing techniques introduced through Chinese influence. Cultures and traditions are evident in the fusion of Chinese and Javanese motifs such as dragons, phoenixes, coastal flora, and wayang figures woven into batik designs.

Period(s) of operation

Batik Lasem is believed to have begun in the 15th century with the arrival of Chinese migrants, blending Chinese and Javanese motifs into distinctive patterns. Its operation flourished during the 17th–19th centuries, especially under coastal trade networks connecting Java, China, and South-East Asia. During the colonial era, Batik Lasem became a key regional industry. Today, it continues as a living tradition, sustaining cultural identity and community-based craftsmanship across generations.



Figure 2: Old Chinese House. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

The history of Batik Lasem is marked by several important events and changes that significantly shaped its attributes. Originating in the 15th century with the arrival of Chinese settlers, Batik Lasem reflected strong cross-cultural exchanges, as Chinese red dye techniques and symbolic motifs such as the phoenix and dragon merged with local Javanese patterns and philosophies. This early integration created a hybrid textile tradition that distinguished Lasem from other batik centres in Java. During the 17th–19th centuries, Lasem's coastal location enabled active participation in maritime trade, linking its products to Chinese, Arab, and South-East Asian markets. Under Dutch colonial rule, batik production intensified as part of a wider commercialisation of local crafts. New materials such as imported cotton and synthetic dyes were introduced, altering both techniques and aesthetics. In the 20th century, industrialisation and mass-produced textiles posed challenges, leading to a decline in artisanal batik workshops. However, revival movements and heritage recognition have reinvigorated Batik Lasem, ensuring continuity of traditional skills while adapting to contemporary market demands and cultural tourism.



Figure 3: Chinese Temple. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Status of the research and historical documentation

Systematic documentation of Batik Lasem began in the early 20th century through colonial reports and museum collecting, and expanded with post-1970s textile studies. Published sources include regional cultural histories and batik scholarship (Heringa & Veldhuisen 1996; Lombard 1996; Reid 1993). More recent works, including exhibitions and catalogues by Indonesian researchers and museums (e.g., Museum Tekstil Jakarta, 2000s–2020s), add valuable insights into typology, motifs, and dye technologies. Unpublished sources comprise family workshop archives (order books, pattern drawings, price lists), community photographs, and oral histories preserved by local NGOs and universities. Current research focuses on cross-cultural iconography, natural dye revival, and mapping the batik creative economy. However, key gaps remain, such as digitisation of private logbooks, scarce technical analyses of historical dyes and fabrics, Chinese-language merchant records, and data on trade and labour networks. Documentation exists in Indonesian, Javanese, Chinese (Hokkien/Mandarin), Dutch, and English. Records are held in private batik houses in Lasem, Museum Tekstil Jakarta, Tropenmuseum (Amsterdam), KITLV/Leiden University Libraries, and ANRI.

Current status and state of conservation

The current condition of Lasem's batik heritage is a mix of continuity and decline. Traditional workshops still operate, many family-owned and preserving original tools such as canting, copper stamps, and natural dyeing vats. While much equipment remains functional, some older facilities are disused or adapted for modern production. The urban fabric—heritage houses, workshops, and Chinese temples—largely survives but is under pressure from neglect, economic shifts, and limited conservation.

Known threats

Batik Lasem faces threats from declining artisan numbers, competition from mass-produced textiles, loss of natural dye sources, and neglect of heritage houses and workshops. Younger generations often leave for other jobs, risking continuity of skills. Environmental issues, such as river pollution, also affect production.

Protection status

Batik Lasem is recognised as part of Indonesia's intangible cultural heritage under the Ministry of Culture. Local regulations at the district level support the preservation of heritage houses.

Registration status in the national or local inventory

Lasem is featured in Indonesia's National Intangible Cultural Heritage list (Warisan Budaya Takbenda) for its batik tradition, formally recognised by the Ministry of Culture. Locally, Lasem's heritage houses, temples, and urban fabric are included in Rembang Regency's cultural heritage database and planning documents.

Ownership

In Lasem, most batik workshops and heritage houses remain under private ownership, often passed down for generations. Some properties are under complex multiple-ownership among heirs, while others are privately managed as museums or cultural centres.

Ombilin Coal Mining Heritage of Sawahlunto



Figure 1: Head Office of the Ombilin Coal Mine in Sawahlunto. Photograph by Maya Rosa (2021). CC-BY-SA 3.0 IGO

Contributors:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

Gino Seagames
ICOMOS Indonesia
Member

State, Province, Region
Indonesia
West Sumatra

Industrial Designation
Ombilin Coal Mining of Sawahlunto (OCMHS), in West Sumatra, Indonesia, is a former colonial coal mining site with tangible and intangible cultural heritage throughout the city. A conservation effort by the Indonesian government resulted in its designation as a UNESCO World Heritage Site in 2019. In the late 19th century, the Netherlands East Indies built the Ombilin Coal Mining of Sawahlunto industrial site for the extraction, processing, and transport of high-quality coal in an inaccessible region of Sumatra, during the period of global industrialisation from the late 19th to the beginning of the 20th century.

Industrial classification
Extraction



Figure 2: Head Office of the Ombilin Coal Mine in Sawahloento 1920. Source: Leiden University Libraries. Public domain.

Brief description

The Ombilin Coal Mining Heritage of Sawahlunto is a World Heritage property with three integrated areas, or components. Area A; Sawahlunto Mining Site and Company Town, includes mining tunnels, processing facilities, and the purpose-built town for workers. Area B; Railway Facilities, covers the 155 km mountain railway with railway, bridges, tunnels, and stations linking Area C; Coal Storage at Emmahaven Port, contains facilities for storing and shipping coal from the mines, located on Sumatra's West coast.

The majority of Sawahlunto's population is Minangkabau ethnic. Furthermore, a small, thriving community, known as the Orang Tangsi (People of the Tangsi), or Orang Barak (People of the Barracks), existed during the Dutch occupation. The Orang Tangsi were a mixed forced labour community of Javanese, Madurese, Bugis, and Sundanese origins in the 19th century. This community still exists and resides in what were once barracks in Sawahlunto's old town and speaks its creole language, Tangsi. The beautiful natural surroundings, the long history of the coal industry, the multi-ethnic community culture, and the extensive mining heritage, both tangible and intangible, scattered throughout the region, create unique and distinctive qualities.

The quality of the coal in the Ombilin area was comparable to the coal found in Newcastle in Australia (De Locomotief, 1884) or one rank below the coal found in Cardiff, Britain. The coal is historically regarded as high-quality, bituminous coal, known for being hard, relatively low in impurities, and having a high calorific value.

Period(s) of operation

The period of OCMHS operation was from the late 19th century to 2002.

Key events/chronology and changes to relevant attributes

The Ombilin Coal Mining of Sawahlunto began in 1892 under the Netherlands East Indies, following the 1868 discovery of high-quality bituminous coal. Documentation from the late 19th to 20th centuries is extensive, mostly in Dutch and later Indonesian. Published sources include colonial engineering



Figure 3: Interaction between the community and heritage buildings during annual International Songket Silungkang Carnival 2025. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

reports, mining statistics, and UNESCO studies, while unpublished archives hold technical drawings, logbooks, payrolls, and photographs at ANRI, local archives in Sawahlunto, the Dutch National Archives, and KITLV. Records are generally safe and accessible, though digitisation is needed. The Sawahlunto Museum network preserves artefacts, machinery documents, and oral histories, with some business records kept by PT Bukit Asam. Current research, led by Indonesian universities and international partners, explores industrial heritage conservation, tourism, labour history, and socio-environmental change. Key gaps remain in intangible heritage documentation, especially on forced labour experiences and socio-cultural transformation after mining ceased.

Current status and state of conservation
All parts of this multi-component ensemble have a high degree of authenticity, retaining their as-built original form and design, materials and substance, location and setting, management system, use and function. All physical attributes of this ensemble, with its systemic linkage of shaft-and tunnel mines, a 155-km-long mountain railway system, and a seaport, are complete and intact within the boundaries of the property, and are readable as to their location and form.

Known threats
World Heritage Site programmes for the management body have not been formalized. Although the programmes already indicated in the management plan, which was submitted during nomination in 2018, these have not been formalised and may need adjustment to meet current and future needs.

Protection status
The Sawahlunto site is protected as a Cagar Budaya at national and local levels under Indonesian heritage law, reinforced by municipal regulations, and its UNESCO World Heritage status.

Registration status in the national or local inventory
Yes

Ownership
The Ministry of Cultural Affairs coordinates a protection system with multi-level stakeholders, including PT Bukit Asam-UPO managing mines and assets, and PT Kereta Api Indonesia managing stations and railway networks and the City of Sawahlunto.

Pabrik Indarung I PT Semen Padang



Figure 1: The Old Kiln. Photograph by Maya Rosa (2024). CC-BY-SA 3.0 IGO

Contributors:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

Dr. Johny Wongso
Architecture Department of
Bung Hatta University

State, Province, Region
Indonesia
West Sumatra

Industrial Designation
The Indarung I Factory Archives of PT Semen Padang from 1910-1972 were officially designated as Memory of the World Committee for Asia and the Pacific (MOWCAP) by UNESCO at the 10th MOWCAP General Meeting held in Ulaanbaatar, Mongolia, on Wednesday, 8th May 2024.

Industrial classification
Mineral Products

The cement production at Indarung I highlights the strategic use of local limestone and clay deposits in West Sumatra, whose quality made the site ideal for early cement manufacturing in Indonesia. By combining these natural resources with imported European technology, Indarung I created a distinctive industrial material that influenced both local building practices and the nation's modernisation.

Brief description
The Indarung I Portland Cement Factory embodies industrial heritage through its pioneering factory design, kilns, and power systems, showcasing tangible attributes of early 20th-century engineering innovation. It played a key role in the colonial economy, supporting infrastructure, railways, and ports, while transforming architecture from public buildings to housing. Its continuity as part of PT Semen Padang demonstrates over a century of industrial operation. The introduction of Portland cement and concrete revolutionised construction, leading to widespread cement factories and transforming colonial building practices, particularly building Sawahlunto coal mining and all concrete construction in Sumatra. One of the intangible heritage attributes is the limestone mining techniques.

Period(s) of operation
1910-present

Key events/chronology and changes to relevant attributes
The transition of the mining and production process at Indarung I from wet to dry methods reflects a broader evolution in global cement technology. Initially, the wet process was adopted due to its suitability for raw materials with high moisture content, but it was energy-intensive and less efficient. The later adoption of the dry process marked a significant technological improvement, reducing fuel consumption, improving kiln efficiency, and aligning with environmental considerations. This shift not only represents technological adaptation at Indarung I but also situates the site within the global narrative of industrial innovation and sustainable cement production practices.



Figure 2: Slurry basin and kiln. Photograph by Maya Rosa (2024). CC-BY-SA 3.0 IGO

Status of the research and historical documentation
The Indarung 1 complex was designated a national cultural heritage site in 2024, and its archives are designated as part of the UNESCO Memory of the World Programme.

Tangible remains of the Indarung 1 area, such as machinery, are present but incomplete. The Indarung 1 area is sometimes used as a venue for cultural events.



Figure 3: Round pipe slurry basin. Photograph by Maya Rosa. CC-BY-SA 3.0 IGO

Current status and state of conservation
Tangible remains of the Indarung 1 area, such as machinery, are present but incomplete. The Indarung 1 area is sometimes used as a venue for cultural events.

Known threats
The protection of tangible heritage in Indarung 1 site remains fragile, with many industrial remains facing risks from weathering, natural disasters, and human neglect. Exposure to heavy rainfall, humidity, and extreme climate accelerates the deterioration of structures and artefacts. Furthermore, weak security measures leave heritage vulnerable to theft and illegal trade.

Protection status
Indarung I Cement Factory is protected under Indonesia's Law No. 11/2010 as a Cultural Heritage Site, with provincial listing, conservation rules, and oversight by BPCB integrated into regional planning.

Registration status in the national or local inventory
Designated by the Minister of Education, Culture, Research, and Technology (Kemendikbudristek) as a national-level cultural heritage on March 10, 2023.

Ownership
Semen Indonesia

Pabrik Kina Bandung

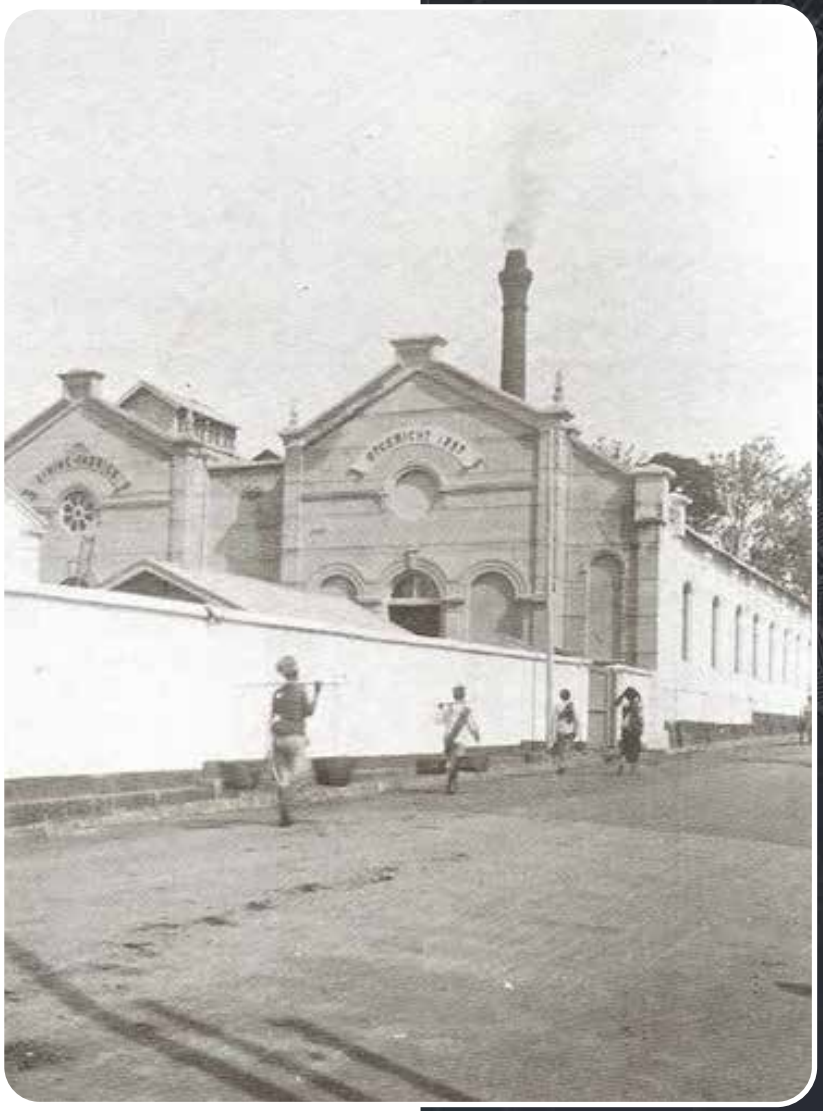


Figure 1. Historical photo of Pabrik Kina Bandung

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

State, Province, Region
Indonesia
West Java Bandung

Industrial classification
Forest Industries

In the 19th century, a malaria outbreak in Batavia caused heavy European casualties, urging the Dutch East Indies government to find a cure. The cinchona tree, native to South America, was found to have the alkaloid drug, quinine derived from its bark. Franz Wilhelm Junghuhn pioneered its cultivation in Java's Priangan highlands. To process the bark into medicine, the government established the Bandoengsche Kinine Fabriek N.V. in Bandung, marking a milestone in colonial medical industry and industrial heritage in Indonesia.



Figure 2. Interior of Pabrik Kina

Brief description

The tangible heritage of the *Bandoengsche Kinine Fabriek N.V.* in Bandung represents a significant colonial-era industrial legacy. Its most notable feature is the industrial building, a rare surviving structure that embodies early pharmaceutical production in Indonesia, specifically for quinine. The factory once played a pivotal role in combating malaria across the Dutch East Indies. Equally important is the surviving cinchona plantation, the last of its kind, which provides a living link to the original raw material source. Together, these elements illustrate the historical intersection of science, medicine, and colonial industry, preserving vital evidence of Bandung's industrial heritage.

The intangible heritage of the *Bandoengsche Kinine Fabriek N.V.* includes knowledge and skills in cinchona cultivation, bark processing, and quinine extraction. It reflects colonial-era scientific innovation, pharmaceutical practices, and labour traditions that connected local expertise with global medical needs, leaving enduring cultural and educational legacies.

Period(s) of operation

The Pabrik Kina Bandung, officially established in 1896 as the *Bandoengsche Kinine Fabriek N.V.*, marked a significant industrial and medical milestone in the Dutch East Indies, created to process quinine from cinchona bark cultivated in the Priangan highlands. Under the scientific leadership of Franz Wilhelm Junghuhn and subsequent Dutch botanists, the factory became one of the world's largest quinine producers in the early 20th century, contributing substantially to colonial revenue and international pharmaceutical trade. The factory complex reflected late 19th-century Dutch industrial architecture, with functional brick structures, large chimneys, and processing machinery imported from Europe. Over time, changes included modernization of equipment during the early 20th century to increase efficiency, while its role expanded to support global demand, especially during World Wars I and II. After Indonesian independence in 1945, the factory was nationalised, continuing production under state management, though its output declined with the rise of synthetic anti-malarial drugs in the mid-20th century. Today, the physical remains symbolise a layered history of science, colonial economy, and industrial heritage in Bandung.

Status of the research and historical documentation

Research and historical documentation related to Pabrik Kina Bandung *(Bandoengsche Kinine Fabriek N.V.)* highlight its significance in both colonial industrial history and global medical development. Documentation began in the late 19th century through colonial archives, government reports, and botanical studies under Franz Wilhelm Junghuhn and later Dutch agronomists. The factory itself was documented in Dutch technical journals, company records, and photographs that emphasized its architectural design, production processes, and role in pharmaceutical exports. After independence, historical attention shifted, with Indonesian archives (ANRI) and university theses recording the transition of the factory from Dutch to Indonesian state ownership. Contemporary scholarship, particularly from the 1990s onward, situates the factory within broader discussions of industrial heritage, medical history, and Bandung's urban development. Many technical records are housed in Dutch repositories such as *Nationaal Archief* and KITLV, while local archives in Bandung hold limited material. Recent heritage studies have noted gaps in systematic cataloguing of surviving buildings, machinery, and oral histories of workers.

Current status and state of conservation

The Pabrik Kina Bandung building still stands as one of the key industrial heritage sites in the city, though much of its original machinery has been lost or removed. The structure remains in fair condition but faces functional repurposing pressures. One plantation that remains in operation is Pabrik Kina Bukit Unggul near Bandung. While acknowledged as an important heritage site, conservation measures are limited, and preservation requires stronger attention and systematic protection efforts.



Figure 3. Bandoengsche Kinine Fabriek N.V. Foto Tropen Museum

Known threats

The heritage of Pabrik Kina Bandung faces multiple threats, including structural decay, moisture, and inadequate maintenance. Urban development pressures in Bandung threaten both the factory site and the surrounding area, risking demolition or insensitive adaptive reuse. Meanwhile, the surviving cinchona plantation faces deforestation, land conversion, and declining cultivation, which jeopardizes its continuity.

Protection status

Only within the local city protection.

Registration status in the national or local inventory

The quinine factory building in Bandung is partly designated as a Bandung City-Level Cultural Heritage Building, while the status of Bukit Unggul plantation is not on the list.

Ownership

PT Kimia Farma

PT Pindad's Military Weaponry



Figure 1: Interior of the Artillery Construction Shop in Bandung, established on January 1, 1851, during the 75th anniversary celebrations (1926). Source: Leiden University Libraries. Public domain

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect Lecturer and Researcher

State, Province, Region
Indonesia
West Java, Indonesia

Industrial classification
Engineering

The Artillerie Constructie Winkel (ACW) and Pyrotechnische Werkplaats (PW), now PT Pindad in Bandung, were established during the Dutch colonial period. These facilities were integral to the production, assembly, and repair of weaponry, ammunition, and explosives. This highlights the intersection of industrial technology, defence infrastructure, and colonial governance.

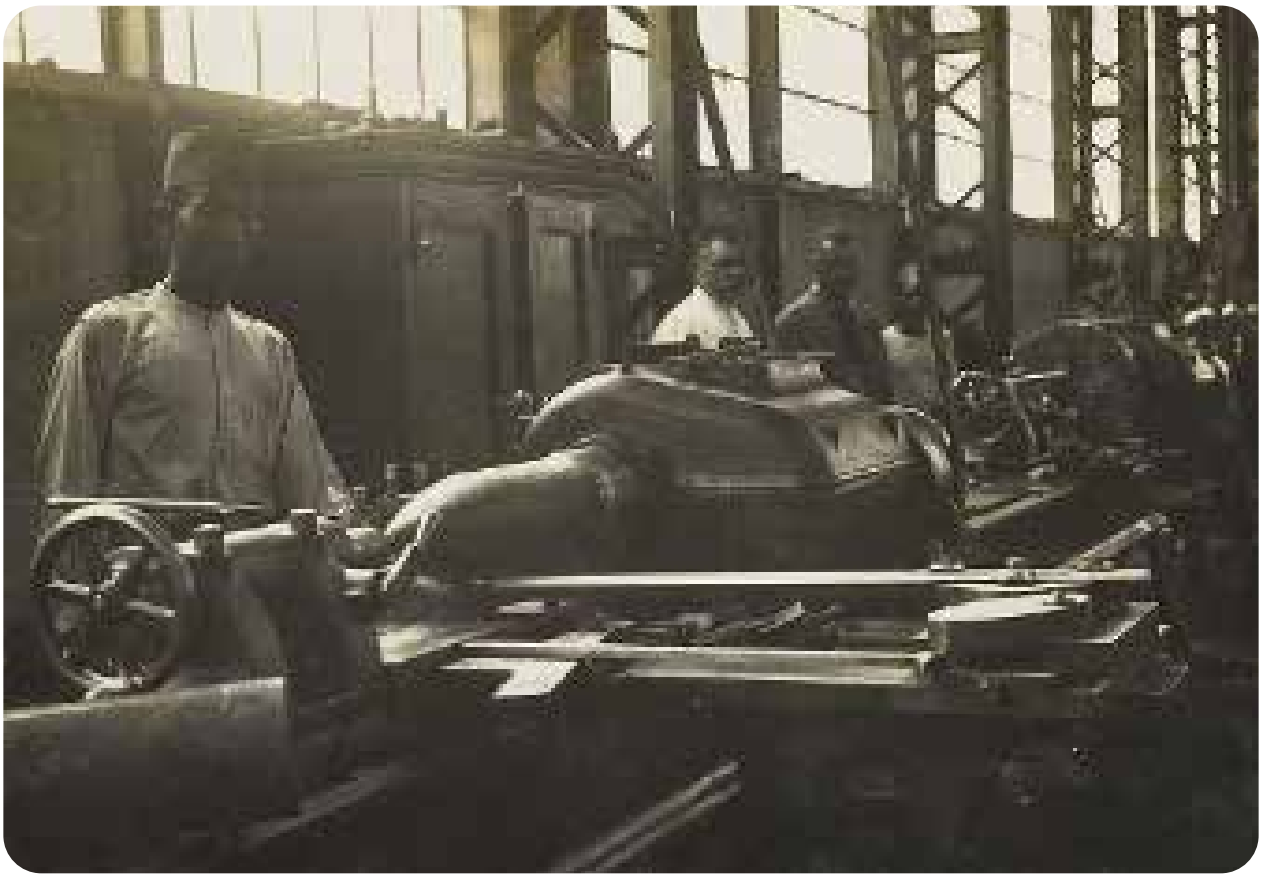


Figure 2: The production of grenades at the turning shop of the Artillery Construction Shop in Bandung, established on January 1, 1851 (1926). Source: Leiden University Libraries. Public domain

Brief description

Physically, the sites embody early 20th-century Dutch colonial industrial architecture, characterized by robust brick and steel structures, large factory halls, ventilation systems, and reinforced workshops designed to handle heavy machinery and explosives. The ACW was equipped for artillery construction and repair, with spaces for machining, forging, and assembling weapons.

Meanwhile, PW contained specialized facilities for producing and testing munitions, gunpowder, and pyrotechnics, including controlled storage areas and laboratories. Rail sidings, transport sheds, and surrounding military housing further reflect their integration into Bandung's broader defence infrastructure. Together, these built forms and material remains provide evidence of technological adaptation to tropical conditions and of Bandung's role as a military-industrial hub. Beyond the physical structures, PT PIndad intangible values linked to knowledge systems, skills, and practices such as technical expertise in metallurgy, explosives handling, and mechanical engineering transferred from Europe to local workers, who were trained under strict hierarchical and military discipline. The sites also represent cultural narratives of colonial governance, labour organisation, and Bandung's strategic role in the Dutch East Indies' defence system.

Period(s) of operation

PT Pindad's history began in 1808 as a military equipment workshop, Constructie Winkel (CW), under the Dutch East Indies government. After several name changes and relocation to Bandung in 1918–1920, the factory was taken over by the Indonesian government after independence and became the Weapons and Munitions Factory (PSM) in 1950. The name Army Industry (Pindad) was adopted in 1962, and in 1983, PT Pindad was designated a State-Owned Enterprise (BUMN) of Indonesia.

Key events/chronology and changes to relevant attributes
Established in 1808 as the Constructie Winkel in Surabaya, the facility was later relocated to Bandung in 1923 under the name Artillerie Constructie Winkel (ACW). During the Japanese occupation (1942–1945), it was renamed Dai Ichi Kozo and repurposed for the Japanese war effort, marking its first major transformation. After independence in 1947, the Indonesian military took over, and by 1950 the facility became part of Djawatan Perindustrian Angkatan Darat (Djiad), focusing on weapons and equipment for the new republic. In 1962, it evolved into Perindustrian Angkatan Darat (Pindad), solidifying its role in Indonesia's defence industry. Over time, Pindad expanded beyond small arms and ammunition to include heavy equipment, vehicles, and dual-use products for civilian sectors. Key changes to its attributes include modernisation of production lines, adoption of international defence technologies, and diversification into non-military industries. Today, PT Pindad represents both continuity of colonial-era industrial infrastructure and adaptation to Indonesia's national defence needs, reflecting a layered history of technological transfer, sovereignty, and industrial resilience.

Status of the research and historical documentation
Research and historical documentation of PT Pindad remain limited and fragmented, reflecting its sensitive defence-related role. Early colonial-era records, such as those on *Artillerie Constructie Winkel* (ACW) and *Pyrotechnische Werkplaats* (PW), are preserved in Dutch archives (Nationaal Archief, KITLV), while Indonesian sources focus on post-independence transformation. Publications on military history, industrial heritage, and defence industries briefly mention Pindad, but comprehensive studies are scarce. Documentation is mostly institutional and unpublished, such as company reports, technical manuals, and government archives. Current gaps include limited public access to classified materials and a lack of systematic heritage research on its industrial and architectural evolution.

Current status and state of conservation
Some colonial-era buildings still survive and are actively reused within the company's complex, though modified for modern functions. Conservation efforts are minimal, as heritage recognition is not prioritized compared to Pindad's operational role as a defence manufacturer.

Known threats
Structures face risks from industrial modernization, security restrictions limiting heritage access, and a lack of dedicated preservation programmes, leaving their long-term sustainability uncertain.

Protection status
There is no formal protection status; buildings remain within an active defense industry complex, limiting public access and conservation, with preservation overshadowed by security and operational priorities.

Registration status in the national or local inventory
Not yet formally registered in Indonesia's national or local cultural heritage inventories. While its historical value is acknowledged, its classification as an active defense facility has delayed formal recognition, conservation planning, and wider inclusion in heritage management frameworks or public heritage registers.

Ownership
PT Pindad (Persero) is owned by the Republic of Indonesia, and the majority of its shares are held by PT Len Industri, the holding company, making it a State-Owned Enterprise (BUMN) operating in the defence and commercial product industries.

Rumah Atsiri



Figure 1: Rumah Atsiri. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

State, Province, Region
Indonesia
Plumbon Karanganyar Regency, Central Java

Industrial classification
Chemicals

Plumbon village was selected as the site location due to its natural potential that fits the planting of essential oil ingredients. The water source that is critical to the distillation process was also available in large quantities from a river close by.



Figure 2: Essential Oil Display. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

Brief description
The tangible remain is the factory complex a building of the Citronella distillery facility established in 1963. The intangible remains are the knowledge, skills, and innovation related to essential oils.

Period(s) of operation
1961 - Pesent

Rumah Atsiri, originally built in 1963 as a citronella oil factory established through collaboration between Indonesia and Bulgaria, reflects significant shifts in industrial and cultural history. During its operational phase, the site underwent technological adaptation from traditional distillation methods to more modern essential oil processing techniques. After the factory ceased operations, the complex experienced abandonment and partial deterioration, marking a critical phase of decline. Its adaptive reuse in the 2010s as a heritage-based educational and tourism destination represents a major transformation. Today, restored buildings, gardens, and interactive exhibitions have redefined its function while preserving its industrial identity.

Status of the research and historical documentation
Research and historical documentation of Rumah Atsiri remain relatively limited but steadily growing since its adaptive reuse in the 2010s. Early documentation is mainly industrial, consisting of mid-20th-century records of the Indonesia–Bulgaria collaboration in citronella oil production, archived in government reports and company files, though much remains unpublished. Current scholarship focuses more on heritage reuse, sustainable tourism, and the cultural value of essential oils, supported by exhibitions, promotional publications, and architectural studies.

Current status and state of conservation
Rumah Atsiri is well-preserved through adaptive reuse of the former citronella factory built in the mid-20th century. Original structures have been carefully restored and integrated with new functions, such as museum displays, workshops, and botanical gardens. The site is maintained in good condition, with continuous conservation supported by private management and community programmes.

Known threats
The challenge is the gradual loss of industrial memory as intangible heritage, as fewer original workers remain to share their knowledge. Additionally, dependence on private management makes long-term sustainability vulnerable to economic downturns or shifts in business priorities.

Protection status
Currently, Rumah Atsiri does not have a formal protection status as a heritage site under Indonesia's Heritage Law. Its conservation is primarily managed through private initiatives by the site's owners.

Registration status in the national or local inventory
No

Ownership
PT. Rumah Atsiri Indonesia.



Figure 3: Interior Corridor. Photograph by Maya Rosa (2022). CC-BY-SA 3.0 IGO

Salt Production at Sumenep



Figure 1: This building was once the central power plant of PT Garam in Sumenep, Madura. Source: Tempo

Contributor:
Dr. Maya Rosa
ICOMOS Indonesia
Architect, Lecturer and Researcher

State, Province, Region
Indonesia
Sumenep, Madura Island, East Java

Industrial classification
Mineral Products
Food & Drink Processing

The salt production in Sumenep is proposed as an industrial heritage site due to its historic salt industry, which flourished during the Dutch East Indies period. The town played a key role in regional trade, which housed the Sumenep Palace (Keraton), reflecting the cultural and political history that coexisted with industrial development. Together, the salt industry and royal heritage create a unique cultural landscape, representing both economic and sociopolitical dimensions of Indonesia's past.

Brief description

The town of Sumenep presents a unique blend of industrial and cultural heritage, particularly evident in its salt production industry during the Dutch colonial era, alongside the enduring presence of the Keraton (royal palace). The most significant tangible attributes are the expansive salt fields, which were systematically organised under colonial policies to maximize production for export. Supporting this were salt warehouses and storage facilities, many of which still stand today, reflecting the scale and infrastructure of the salt industry. These warehouses, built with functional colonial architecture, tell the story of an extractive economy deeply tied to both local livelihoods and international trade. Alongside these industrial structures, the Keraton Sumenep, with its distinct blend of Javanese, Madurese, Islamic, and European architectural influences, remains a central tangible landmark.

The intangible attributes are embedded in the traditional knowledge systems of salt-making and the cultural practices of the royal court. Local communities preserved generational expertise in preparing salt pans, timing production according to seasonal cycles, and conducting rituals associated with the salt harvest.

Meanwhile, the Keraton preserved intangible traditions of governance, ceremonies, arts, and performances, which interacted with industrial practices through systems of authority and labour organisation.

Period(s) of operation

15th century - Present

Salt production in Sumenep dates back to the 15th century, when it was first introduced to Madura in Pinggir Papas, located between Sumenep and Kalianget. Over the centuries, salt became a vital industry. During the 17th–19th centuries, the Dutch East Indies Company (VOC) controlled the trade through a strict monopoly. From 1930 to 1986, the government managed the former VOC salt fields. In the 21st century, salt farmers in Madura gained more independence, emphasizing smallholder farming and reducing reliance on monopolistic systems.



Figure 2: Salt farmers in Sumenep. Source: Wawa Sansejarah

Status of the research and historical documentation
To date, no systematic research has been undertaken on the nominated property in Sumenep. Existing documentation remains limited and fragmented, with little analysis of industrial processes, technologies, or their broader socio-economic context. As a result, the industrial heritage value of the property has yet to be fully documented and articulated.

Current status and state of conservation
The salt heritage in Sumenep remains partially intact, with traditional salt fields in Kalianget and Pinggir Papas still operating, though on a smaller scale. Tangible heritage includes old warehouses and colonial-era salt infrastructure, many of which face deterioration due to age and limited maintenance. Intangible heritage, such as traditional salt-making skills, continues within local communities, sustaining cultural continuity.

Known threats
The salt heritage of Sumenep faces threats from climate change, rising sea levels, and erratic rainfall, which disrupt salt production cycles. Neglect of colonial warehouses and infrastructure accelerates deterioration.

Protection status
Its preservation depends largely on continued use, local practices, and informal recognition of its historical and cultural value, leaving it potentially vulnerable to alteration or redevelopment.

Registration status in the national or local inventory
None. The site remains unregistered in current heritage inventories, underscoring the importance of future assessment and inclusion within national and local industrial heritage documentation efforts.

Ownership
PT Garam Indonesia



Malaysia

Contributors:

Take Bane Lim
Design Principal, Arkitek Shilpa

The Industrial Heritage of Malaysia, the Golden Chersonese of Ancient Times

Introduction

The Malayan peninsula is the southernmost tip of the continent of Asia, extending like a large promontory into the West Philippine Sea, where a vast grouping of thousands of islands, large and small make up Nusantara, the Malay Archipelago. Located slightly north of the Equator, the climate is hot, wet and humid, with the land mass comprising a central main range of mountains which extends outwards with coastal plains towards the east and west. The terrain is covered with luscious equatorial jungles, teeming with flora and fauna, and hosting the oldest rainforests in the world. The Indigenous Peoples (Orang Asli) comprise Negritos, Senoi and Aboriginal-Malay. Migrants came from India, Sumatra (Batak, Achinese, Minang) Sulawesi (Bugis), Siam, Champa, Java and China throughout the millennia of habitation.

Historical Timeline

Traces and remnants of Kedah Tua (Old Kedah), the oldest civilisation of South-East Asia are found in the northern state of Kedah in Sungai Batu, Bujang Valley of Peninsular Malaysia, where a Hindu-Buddhistic kingdom was founded between the 4th and 7th century CE (Jacq-Hergoualc'h, 2002). Intrepid seafarers were earlier blown by monsoon fair winds from the eastern coastline of India to Old Kedah: where they sighted Mount Jerai (Ht 1,217 m), with Bujang Valley at its foothills on the mainland from their ships. These mariners brought along with them the ancient Indian technology of iron ore smelting and casting. Hence, they brought forth the legacy of this industrial heritage where ancient iron foundries produced large outputs that were exported to China, India and the Arab world during that period.

The European colonists, starting with the Portuguese, came to the Far East in search of spices to bypass the monopoly of the merchants of Venice, who were at the European end of the ancient Silk trading route with trade in tea, silk, spices, porcelain et al. Explorer Vasco da Gama successfully rounded the Cape of Good Hope at the southern end of the African continent in his boat and onwards to Calicut, India in 1497. By 1511, they had conquered the prosperous port of Malacca in Malaya, which was founded in the early 1400s by a Sumatran Malay prince Parasmeswara

of the Srivijaya Empire, who converted to Islam in 1414 and became Sultan Iskandar Shah (Sandhu & Wheatley, 1983). Malacca's prosperity as a trading port has been attributed to its geographical location along the Straits of Malacca and being a vital staging station of Ming dynasty Admiral Cheng Ho, who embarked on his great voyages to explore the oceans and seas for Imperial China. In 1641, the Dutch captured Malacca from the Portuguese, and it remained under Dutch control for nearly two centuries before it was ceded to the British in 1825, when Bencoolen in Sumatra was exchanged for Malacca.



Figure 1: Tanjung Tualang Tin Dredge No.5 (TT5). Photograph by Muhammad, Abd. Razak (2020). CC-BY-SA 3.0 IGO

The British, under Captain Francis Light, arrived at the island of Penang in 1786 when they acquired a foothold in Malaya via Penang from the Sultan of Kedah. By 1825, they had established the Crown colony of the Straits Settlements consisting of Penang (1786), Malacca (1825), Singapore (1819), Dindings (1874), now Manjung, and Province Wellesley (1800) now Seberang Perai. In 1895, they established the Federated Malay States (FMS) of Perak, Selangor, Pahang and Negri Sembilan where they acted as advisors to the ruling sultans of the FMS and administered the FMS, whist the sultans remained the political and spiritual leaders of their Muslim subjects.

The Federation of Malaya was granted its independence from the British in 1957 and later in 1963, the Federation of Malaysia was formed which comprised Malaya, Singapore, Sarawak and Sabah. Singapore left the federation of Malaysia in 1965 to become a separate nation.

In the Victorian era, the intrepid traveller and writer Isabella Bird (1831–1904), following her travels in Malaya in 1879, aptly described Malaya in her book *The Golden Chersonese and the Way Thither* which was well-

endowed with natural resources in its mineral wealth such as gold, and withpetroleum discovered much later. The 'Golden Chersonese' is the ancient name for the Malay Peninsula, given by the Greek geographer and astronomer Ptolemy.

Industrial Heritage of Malaysia

In 1867, the British brought in rubber seeds originally from Brazil, via the *Royal Botanic Gardens, Kew* in the United Kingdom of Great Britain and Northern Ireland (UK) and the *Singapore Botanic Gardens*, both of which have now been designated World Heritage sites. The 140- year old tree from the first batch of 11 seedlings brought in from *Singapore Botanic Gardens* is still alive in Kuala Kangsar, Perak (Bernama News Agency, 2023). In the FMS, European planters created large rubber plantations to produce natural rubber as a commercial crop especially on the western coastal plain where Perak, Selangor and Negri Sembilan are situated. Elsewhere, throughout the land, smallholdings were run by locals and immigrant labour from India and China. With the discovery of vulcanisation of rubber with new uses like rubber tyres, the industry grew to such an extent that Malaysia became the world's largest producer of natural rubber in the 19th and 20th centuries. Much later, the industry moved downstream in the 1990s to become the world's largest producer of natural rubber gloves and medical products. As a testament to this history, the restored smokehouse for small holdings in Lunas, Kedah (1930s) is listed as industrial heritage together with the famed Rubber Research Institute of Malaysia housed in a 1930s Art Deco heritage building, which was the leading rubber research institution in the world in its heyday in pre-war Malaya.

Although tin has been mined in Malaya along river banks for centuries, it was only when large tin deposits were discovered in Larut in 1848 in the Kinta Valley of Perak, and Kuala Lumpur in Selangor in 1857, that the tin mining industry developed (Yip, 1969). With Chinese immigrants forming the backbone of that industry, Malaysia grew to become the world's largest producer of tin until its decline in the 1980s . The British built infrastructure of roads and railways to facilitate the quick transportation of tin ingots to the ports where they were exported to the UK. The legacy of the tin industry in Malaysia is listed in two original tin dredges in Tualang, Perak and Dengkil, Selangor, the underground tin mine in Sungai Lembing, Pahang and the current world's largest manufacturer of pewterware, the Royal Selangor in Kuala Lumpur.

The maritime industrial heritage of Pulau Duyung, Kuala Terengganu in the northeastern state of Terengganu comprised seafaring Bugis people who originated from Celebes (Sulawesi) within the South-East Asian archipelago or Nusantara. In the 1700s, the migrant Bugis brought along with them, their traditional boat-building skills and established an enclave for that industrial heritage, which has lasted till now, when sadly the craft is dying out with the onslaught of modern boat-building techniques and materials.



Figure 2: The Industrial Heritage of Malaysia, timeline.
Author: Lim Take Bane. CC-BY-SA 3.0 IGO

The small-scaled cottage industry of making pumpkin-shaped ceramic vessels called labu Sayong using a special local clay started around 1900 in Sayong, Perak. The cottage industry of weaving traditional fabrics of the northern states of Kelantan, Terengganu and Pahang, namely, tenun songket, limar and ikat started around the 15th century. These fine craft traditions need conservation in the face of imported large-scale commercially produced fabrics made using modern machines.
The century-old charcoal-making kiln factories in Kuala Sepetang (formerly Port Weld) using mangrove wood are also listed as worthy industrial heritage of Malaysia. It is a sustainable eco- sensitive industry providing employment for the area.

National Inventory or Database for the Country's Built Heritage

There is a National Heritage Register which is established and overseen by the Department of National Heritage, in accordance with the National Heritage Act 2005 (Act 645). This law provides a comprehensive framework for safeguarding the country's diverse cultural (and natural) heritage, superseding earlier laws like the Antiquities Act of 1976. The information regarding the National Heritage Register of Malaysia is available online through the Official Portal of the Department of National Heritage.

There is also a documentation of 20th century heritage of the city of Kuala Lumpur published by DOCOMOMO Japan, which includes industrial heritage buildings. The publication is entitled *mASEANa: Appreciating modern ASEAN architecture*. This publication is available online: https://www.maseana.iis.u-tokyo.ac.jp/phone/book.html

National System of Statutory Protection for Built Heritage and the Inclusion of Industrial Heritage

Industrial heritage is in the national inventory but they are under-represented. Protecting these sites is a work in progress, but sites like the Rubber Smoke House in Kedah and the former mining landscapes in the Kinta Valley are already protected.

References:

Bernama News Agency (2023) NST newspaper [online] Available at https://www.nst.com.my/news/nation/2023/06/922952/malaysias-oldest-rubber-tree-now-worth- nearly-rm200000

Bird, I.L. (1883) The Golden Chersonese and the Way Thither. London: John Murray.

Drabble, J.H. (2000) An Economic History of Malaysia, c.1800-1990: The Transition to Modern Economic Growth. London: Macmillan Press.

Jacq-Hergoualc'h, M. (2002) The Malay Peninsula: Crossroads of the Maritime Silk Road (100 BC - 1300 AD). Leiden: Brill.

Sandhu, K.S. and Wheatley, P. (eds.) (1983) Melaka: The Transformation of a Malay Capital c.1400– 1980. Kuala Lumpur: Oxford University Press.

Yip, Y.H. (1969) The Development of the Tin Mining Industry of Malaya. Kuala Lumpur: University of Malaya Press.

Ancient Iron Smelting Industry of Bujang Valley, Kedah

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Extraction



Figure 1. A water compartment next to the furnace. Photograph by Muhammad, Abd. Razak (2020). CC-BY-SA 3.0 IGO



Figure 2: The largest ever furnace found by a group of researchers from the Centre of Global Archaeological Research, CGAR or PPAG of University Science of Malaysia (USM) at Kampung Padang Chicak, Jeneri, Sik, Kedah. Photograph by Muhammad, Abd. Razak (2020). CC-BY-SA 3.0 IGO

Introduction

The people responsible for the iron smelting industry in the Sungai Batu Archaeological Complex (SBAC) of Bujang Valley, Kedah, were part of a sophisticated, cosmopolitan society. This formed the backbone of the early Kedah Kingdom, which operated from approximately the 2nd century BCE to the 10th century CE. The indigenous population then was likely *Orang Asli* (Indigenous Peoples) and early Malay communities. They possessed deep knowledge of the local environment, including the sources of iron ore (laterite), water (for power and cooling), and vast timber supplies from the rainforest, which were needed to produce charcoal for fuel (Mokhtar & Shaiful,2017).

The Bujang Valley was a major entrepôt (trading port) on the maritime Silk Road of China. Archaeological evidence, especially the abundance of Hindu-Buddhist temple ruins (candi) and Sanskrit inscriptions, suggests a strong Indian influence. Traders and artisans from the Indian subcontinent may have provided initial technological impetus or, more likely, integrated with the local society to manage and refine the industry for the export market (Khaw, 2016).

The people of ancient Kedah were not a single homogeneous group. They were a fusion of local Malay/Orang Asli culture with Indian, and to a lesser extent, Srivijayan and other South-East Asian influences. This hybrid society possessed the organisational skills, maritime connections, and technical knowledge to establish a large-scale export industry (Andaya & Andaya, 2017).

The technology for iron smelting in South-East Asia is a subject of academic debate, with two primary theories. The first theory points to evidence of basic ironworking in other parts of South-East Asia (like the Philippines and Viet Nam) dating back centuries. The people of the Malay Peninsula may have had their own foundational knowledge of bloomery smelting (the process of directly reducing iron ore into a spongy mass of iron called a bloom). The technology in Bujang Valley could represent a highly advanced and scaled-up local innovation, developed to exploit rich local resources for trade (Mokhtar & Shaiful, 2017) (See Figures 1 and 2).

The second theory, which is more widely supported, indicates strong influences from India. The furnaces found in Sungai Batu, known as 'bowl furnaces', show strong similarities to early iron smelting technologies used in South India and Sri Lanka (Mokhtar & Shaiful, 2017).
Indian traders, arriving in old Kedah for its gold, aromatic woods, and other natural products, would have recognised the abundance of iron ore and fuel. They could have transferred and adapted their existing smelting knowledge to the local context. This entailed a clever adaptation using local materials (laterite ore and clay for furnace construction) to produce a high-demand commodity. The transfer would have included the practical knowledge of furnace design, air draft management (using bellows), temperature control, and bloom extraction (Mokhtar & Shaiful, 2017) (See Figure 3).

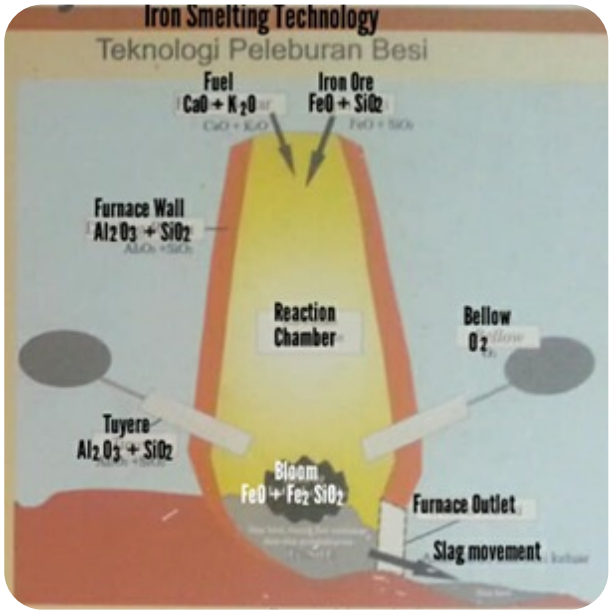


Figure 3: Iron smelting technology - Sungai Batu iron smelting industry produced iron in a form of 'bloom'. The process is called 'bloomery' and the process takes place in a 'furnace'. Iron 'ingnots' were produced from bloom iron. Author: Muhammad, Abd. Razak (2020). CC-BY-SA 3.0 IGO



Figure 4:Intact furnaces from iron smelting sites in Jeniang, located in the upper reaches of the Sungai Muda, 45 km from the Sungai Batu site. Photograph by Mokhtar, Saidin (2021). CC-BY-SA 3.0 IGO

In summary, the technology was most probably a syncretic adaptation of Indian technological concepts that were expertly applied and refined by a local workforce using locally available materials, creating a distinct and highly successful industrial practice (See Figure 4).

It transformed old Kedah from a mere transit port into a primary producer and exporter of a critical raw material. Iron was essential for tools, weapons, and construction, making it a commodity as valuable as gold. This industry would have been the primary economic engine of the kingdom, funding the construction of its temples and granting it significant political influence as a major maritime power (Munoz, 2006).

Before its discovery, historians wondered where regional empires like Srivijaya (based in Sumatra) and later Majapahit (Java), sourced the iron for their vast armies and tools. The Bujang Valley provides the answer. It served as the strategic foundry for South-East Asia, supplying the region with this vital material (Andaya & Andaya, 2017).
The scale of the industry—with over 90 sites identified—implies a highly organized, advanced society with advanced skills in logistics, labour management, specialization (miners, charcoal makers, smelters, blacksmiths, traders), and engineering (water management for the furnaces) (Soo, Giselle 2023).

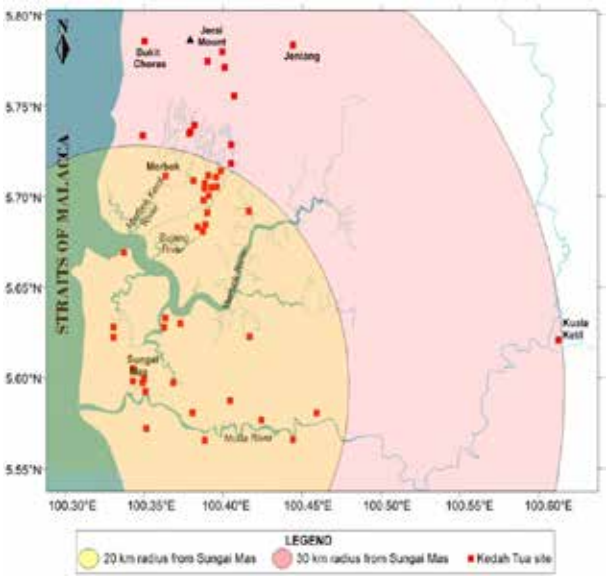


Figure 5: Iron Smelting Industry of Kedah Tua: A Geophysical Mapping for Buried Furnaces. Author: Mokhtar, Saidin (2020). CC-BY-SA 3.0 IGO

Heritage significance

Sungai Batu Archaeological Site is the epicentre of this heritage. Excavations by Universiti Sains Malaysia (USM) have revealed smelting sites, ritual monuments, administrative buildings, and a port system, describing a complete industrial complex (Mokhtar & Shaiful, 2017).
The discovery rewrote Malaysian history books. It showed the Malay Peninsula was home to a sophisticated, technologically advanced civilization long before the era of the Islamic sultanates. It provides a deep historical narrative for Malaysia's modern identity as a trading and industrial nation (Universiti Sains Malaysia, 2024).
This heritage is fragile and has faced threats. The controversial destruction of a 'candi' or temple site within the valley in 2013 highlighted the tension between development and preservation. The sites are often just below the surface of oil palm plantations.

Efforts are ongoing to preserve and promote the area. The Bujang Valley Archaeological Museum serves as the custodian of many artifacts. The Sungai Batu site itself is being developed as an open-air museum, allowing visitors to walk among the excavated iron workshops and see the ancient furnaces, making this incredible heritage tangible for the public. (Universiti Sains Malaysia, 2024)

In conclusion, the iron smelters of ancient Kedah were a multicultural society that masterfully combined local resources with adapted foreign technology. They established Southeast Asia's first large-scale export industry, making the Bujang Valley a crucial economic and technological hub for the region for over a millennium. Today, its remnants stand as a testament to Malaysia's ancient industrial prowess and form a critical, though still under-appreciated, part of its national heritage.

References:

Andaya, B. W. and Andaya, L. Y. (2017) A History of Malaysia. 3rd Edn. London: Palgrave Macmillan.
Khaw, N. R. (2016) 'New Studies on Ceramics and Trade at Bujang Valley, Kedah', Journal of Indo-Pacific Archaeology, 40, pp. 1-6.

Mokhtar Saidin, M. and Shahidan, S. I. (2017) 'The ancient iron smelting in Sungai Batu, Bujang Valley, Kedah, Malaysia', Journal of Archaeological Science: Reports, 13, pp. 186-193.

Mohd Hasfarisham, A. H., Naizatul Akma, M. M., Shyeh Sahibul, K. M., Mokhtar Saidin, M. (2025)

New evidence of ancient Kedah iron smelting sites at Sungai Batu Archaeological Complex (SBAC), Bujang Valley, Kedah, Malaysia', L'Anthropologie: Volume 129, Issue 1, January–March 2025, 103342 https://doi.org/10.1016/j.anthro.2024.103342

Munoz, P. M. (2006) Early Kingdoms of the Indonesian Archipelago and the Malay Peninsula. Singapore: Editions Didier Millet.

Putri Zanina (2016) Ancient seaport of Sg Batu. NST Newspaper. {Online} Available at: https://www.nst.com.my/news/2016/05/147317/ancient-seaport-sg-batu

Soo, Gisele (2023) 'Unearthing ancient histories': The Star Newspaper [online] Available at: https://www.thestar.com.my/lifestyle/travel/2023/09/25/unearthing-ancient-histories

Universiti Sains Malaysia (USM) (2024) Centre for Global Archaeological Research (CGAR). [online] Available at: https://cgar.usm.my/ https://arkeologi.usm.my/

The First Rubber Tree and the Rise of Malaysia's Rubber Industry

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Forest Industries



Figure 1. Rubber tree and ceramic bowl filled with freshly tapped latex. Photograph by Lai, Chee Kien (2002). CC-BY-SA 3.0 IGO

Introduction

For much of the 20th century, Malaya (which became Malaysia in 1963) was the world's undisputed leader in natural rubber production (Drabble, 2000). This dominance began with a handful of seedlings that grew into a global industry. The story began not in Malaysia, but in the Amazon rainforest of Brazil with the wild Para rubber tree, *Hevea brasiliensis*. In 1876, British explorer Sir Henry Wickham smuggled seeds out and brought them to the Royal Botanic Gardens at Kew, London, where they were successfully germinated. In 1877, twenty-two of these seedlings were sent to the Singapore Botanical Gardens (Burkill, 1966). From there, a pivotal figure, botanist Henry Nicholas Ridley, then director of the Singapore Botanic Gardens, brought eleven seedlings to Kuala Kangsar in the state of Perak on the Malay Peninsula (Jackson, 1968). Ridley was instrumental in developing these seedlings into the highly successful Malayan rubber industry by planting them and devising methods for tapping natural rubber latex (see Figure 1) (Singapore Botanic Gardens, 2025).

Those eleven seedlings were the progenitors of Malaysia's vast rubber empire. Remarkably, one original tree from this batch has survived over a century, enduring two world wars. This historic tree is located near the District Office in Kuala Kangsar, Perak. It is well preserved by the state of Perak, remains healthy, and is now a protected tourist attraction (see Figures 2, 3 and 4).

Rubber industry

The industry grew around the process of tapping: making a thin, diagonal cut in the tree's bark to allow the white latex sap to flow into a collection cup (see Figures 5 and 6).

Tapping was done early in the morning in the rubber estates or plantations, and the collected latex was processed in smokehouses to create durable rubber sheets (see Figure 5, 6, 7 and 8).



Figure 2: The first rubber tree planted in Malaysia, estimated to be 148 years old. Photograph by Lai, Chee Kien (2012). CC-BY-SA 3.0 IGO



Figure 3:Ceramic bowls for collecting latex after tapping and other paraphernalia at the adjacent mini museum. Photograph by Lai, Chee Kien (2012). CC-BY-SA 3.0 IGO



Figure 4: Coagulated latex is rolled into sheets with this roller before being hung up to be smoked. Photograph by Lai, Chee Kien (2012). CC-BY-SA 3.0 IGO

A key innovation that fueled demand for natural rubber was vulcanization, which was pioneered by Charles Goodyear in 1839 (Slack, 2002). This process, named after the Roman god of fire, Vulcan, used heat and sulfur to transform soft rubber into a strong, elastic material. Vulcanised rubber became essential for manufacturing tyres, seals, gaskets, hoses, and belts, for the burgeoning automotive industry, driving an insatiable global demand for rubber. Between the World Wars, Malaya's plantations supplied most of the world's natural rubber, making it a critical strategic resource (Drabble, 2000). While the original rubber tree is a living monument to this era, Malaysia's rubber story did not end with the industry's decline in the late 20th century. Although it lost its title as the top producer of raw rubber, the country pivoted successfully. Today, Malaysia is the world's largest manufacturer of downstream rubber products, most notably supplying more than 60 percent of the global demand for medical and surgical gloves—a role that proved vital during the COVID-19 pandemic (Malaysian Rubber Council, 2021).



Figure 5: Tapped rubber tree with latex collected in a ceramic bowl. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

As the sole survivor of those first eleven seedlings, the historic tree in Kuala Kangsar is more than a curiosity; it is an iconic symbol of Malaysia's industrial heritage and its enduring, evolving role in the global rubber industry.



Figure 6:Rubber estate in Segamat, Johor with rubber trees planted in seried rows. Photograph by Lai, Chee Kien (2002). CC-BY-SA 3.0 IGO





Figure 7 and 8: Rubber estate in Segamat, Johore with rubber trees planted in seried rows. Photograph by Lai, Chee Kien (2002). CC-BY-SA 3.0 IGO

References:

The Association of Natural Rubber Producing Countries. (2025). NST Leader: The Malaysian Rubber Board's tough road to revive a fading industry. [online] Available at: https://www.anrpc.org/news/nst-leader%3A-the-malaysian-rubber-board%27s-tough-road-to-revive-a-fading-industry

Burkill, I.H. (1966). A Dictionary of the Economic Products of the Malay Peninsula. 2nd ed. Kuala Lumpur: Ministry of Agriculture and Co-operatives.

Drabble, J.H. (2000). An Economic History of Malaysia, c.1800-1990: The Transition to Modern

Economic Growth. London: Macmillan Press. (EH. Net Encyclopedia, edited by Robert Whaples. July 31, 2004. [online} Available at: https://eh.net/encyclopedia/economic-history-of-malaysia/)

Jackson, J.C. (1968). Planters and Speculators: Chinese and European Agricultural Enterprise in Malaya, 1786-1921. Kuala Lumpur: University of Malaya Press.

Malaysian Rubber Council. (2021). Malaysia's Rubber Glove Industry. [online] Available at: https://www.mymrc.org

Singapore Botanic Gardens (2025). 1888: Ridley and the Malayan Rubber Industry (from 1896) [online] Available at: https://www.nparks.gov.sg/sbg/about/our-history/1888-ridley-and-the-malayan-rubber-industry-from-1896#

Slack, C. (2002). Noble Obsession: Charles Goodyear, Thomas Hancock, and the Race to Unlock the Greatest Industrial Secret of the Nineteenth Century. New York: Hyperion.

The Star (2023). Malaysia's oldest rubber tree now worth nearly RM200,000. [online] Available at: https://thesun.my/malaysia-news/malaysia-s-oldest-rubber-tree-now-worth-nearly-rm200000-MC11136831

U. S. International Trade Commission Executive Briefing on Trade, June 2021

Glove Story: Global Glove Production Amidst the COVID-19 Pandemic Elizabeth Skokan. [online] Available at: https://www.usitc.gov/publications/332/executive_briefings/ebot_glove_story_global_glove_production_amidst_covid-19_pandemic.pdf

Rubber Smoke House in Lunas, Kedah

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Forest Industries



Figure 1: After restoration, the Lunas Story and the Rubber Story Interpretation Centre. Photograph by Loh, Lawrence (2006). CC-BY-SA 3.0 IGO

Introduction

The rubber industry was once the engine of growth in many small Malaysian towns. Lunas, a forgotten rural town, still holds an abandoned rubber smokehouse. The modest timber structure was built in 1961 for rubber smallholders to smoke and dry out rubber sheets made from coagulated latex. It was left unused for more than twenty years, from the 1980s, when rubber plantations around Lunas were closed down.

It is a simple 3-storey timber structure accessed by narrow stairs, with high room heights, tightly sealed, timber-racked, and interwoven with long bamboo poles from which rubber sheets were hung. Smoke was funnelled throughout the rooms, produced from a fireplace at the base of the building. Narrow windows at the rear facade were occasionally opened to ventilate the smoke-rooms. The abandoned rubber smokehouse remained for many decades an eyesore at the town entrance and a reminder of an outdated yet socially and culturally meaningful industry.

Rubber Production Process in Lunas

Latex is collected from the rubber trees by 'tapping'. The method involves peeling a thin strip of bark from the tree to reveal the latex with a cutting knife called a 'kathi'. The strip is then cut in a spiral, causing the latex to ooze out from the incision and flow down into a container. Preservatives such as ammonia are added to the collection cups to prevent the latex from solidifying. After excessive tapping, the trees are left to rest for 1-2 seasons, depending on the amount of rainfall. Tapped latex consists of rubber particles suspended in a serum mainly consisting of water. The South American Indians originally obtained solid rubber by drying out the latex over fires. More sophisticated methods of extracting rubber have been developed since then, depending on the intended use of the final product. Natural rubber is sold as a liquid concentrate or processed into dry solid rubber sheets (Walker Rubber Ltd, n.d.).

The latex collected from the rubber tree contains only around thirty per cent of the weight of rubber.

Latex concentrate is processed by removing some of the water, increasing the rubber content to around sixty per cent solid. The water is removed either through evaporation, adding chemical agents, or using a centrifugal force to spin the water out of the latex.

The processing of the latex into a solid rubber sheet involves the addition of an acid, such as formic acid (also known as methanoic acid). Adding acid to the latex causes it to coagulate (solidify), and the rubber particles will join to form lumps. Once the rubber has solidified, the water can be removed, leaving behind the coagulated rubber as residue. The coagulated rubber can be formed into thin ribbed smoked sheets by passing the rubber through a series of rollers, which help to remove any excess water. Finally, the sheets are dried in smokehouses for up to a week. (Walker Rubber Ltd, n.d.) (See Fig. 2, 3, 4, 5 and 6).



Figure 2: Smoking Room before restoration. Photograph by Loh, Lawrence (2006). CC-BY-SA 3.0 IGO



Figure 3: Smoking Room after restoration. 'The rails on which the rubber sheets were hung were made of bamboo, they are now solidified and well preserved due to the smoking'. Photograph by Loh, Lawrence (2006). CC-BY-SA 3.0 IGO

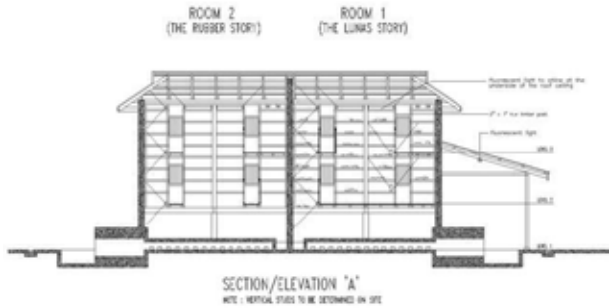


Figure 4: Section/Elevation 'A'. Author: Loh, Lawrence (2006). CC-BY-SA 3.0 IGO



Figure 5: Racks in smoking room, rubber sheets hung on bamboo poles. Photograph by Loh, Lawrence (2006). CC-BY-SA 3.0 IGO



Figure 6: The building has a three-storey high open interior interrupted by a grid of vertical and horizontal timber beams and bamboo sticks. Photograph by Loh, Lawrence (2006). CC-BY-SA 3.0 IGO

Restoration and Cultural Mapping
In 2006, the smokehouse in Lunas was the object of a restoration project which also included the deployment of a cultural mapping initiative involving local schoolchildren and the Lunas' community as a whole. Authenticity and the retention of the 'spirit of place' were central aspects of the whole exercise, which guaranteed the preservation of the tangible structure and also allowed the local community to rediscover and cherish its value (Aga Khan Development Network, n.d.).

Eighty school children learnt about the historical significance of their environment, familiarised with the importance of nurturing 'knowledge keepers', as well as documenting oral history and authenticity in building preservation. Two interpretation narratives (the 'Lunas Story' and the 'Rubber Story') were introduced in the smokehouse structure, which was converted into a museum. These was based on the findings emerged from the e cultural mapping exercise, and so allowed the children to witness how something well past its prime can be given new life. In this view, the initiative highlighted how a modest structure can be not only important for its tangible features, but also how these can support cultural interpretation exercises involving local actors, and therefore how an abandoned utilitarian building can regain its significance for a community.

Overall, the project has allowed the people of Lunas to become aware of their past and the significant but forgotten industrial assets. In doing so, it highlighted how the critical need to conserve heritage structures combines with the opportunities for communities to regain remarkable pride in what they have (Aga Khan Development Network, n.d.) (See Figure 1, 7, and 8).

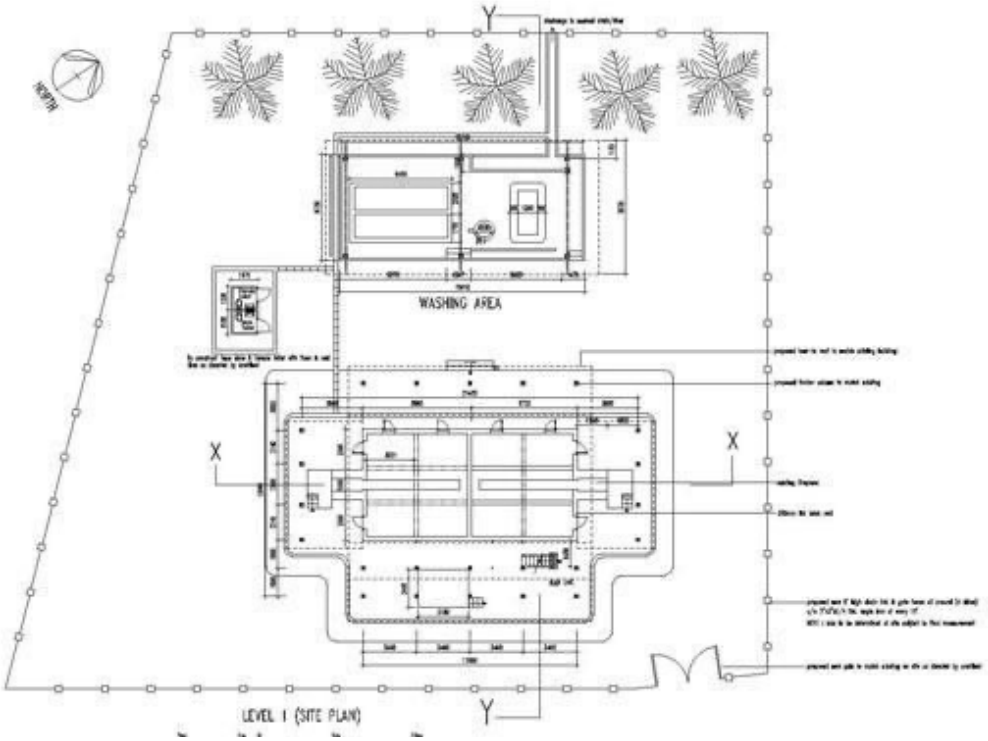


Figure 7: Site Plan. Author: Loh, Lawrence (2006). CC-BY-SA 3.0 IGO

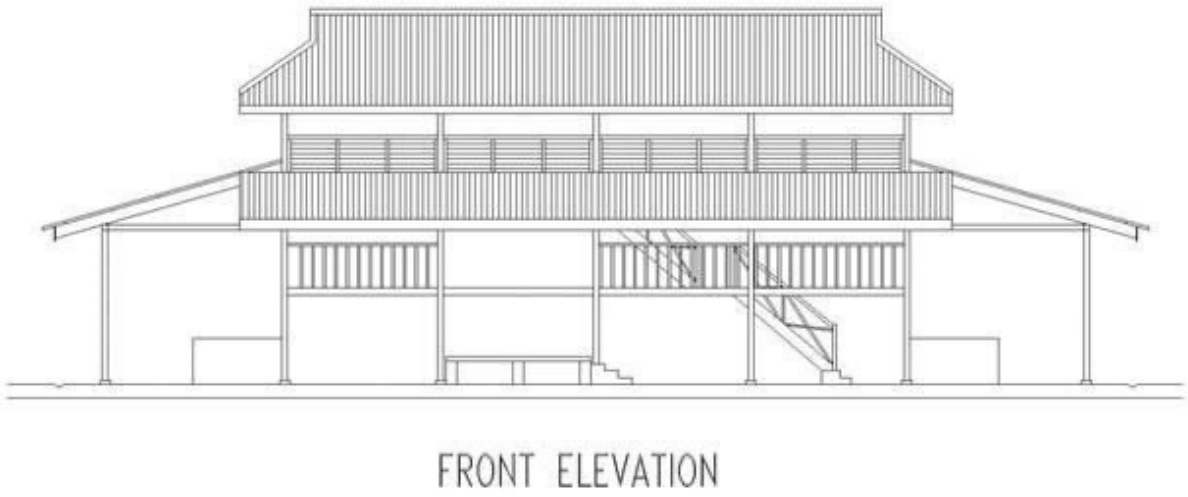


Figure 8: Front Elevation. Author: Loh, Lawrence (2006). CC-BY-SA 3.0 IGO

References:

Aga Khan Development Network (n.d.). [online] Available at: https://the.akdn/en/home

Available at: https://the.akdn/en/how-we-work/our-agencies/aga-khan-trust-culture/akaa/restoration-rubber-smokehouse

Archnet.org. (n.d.) [online] Available at: https://www.archnet.org/sites/6450

Walker Rubber Ltd (n.d.). Rubber Specialist. [online] Available at: https://www.walker-rubber.co.uk/ Available at: https://www.walker-rubber.co.uk/knowledge-hub/where-does-rubber-comes-from-362#:~:text=Adding%20acid%20to%20the%20latex,leaving%20behind%20the%20coagulated%20rubber.

The Rubber Research Institute of Malaysia in Kuala Lumpur

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Forest Industries
Industrial Communities



Figure 1: View of old central block from inner courtyard. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 2: View of front facade of Rubber Research Institute of Malaysia along Jalan Ampang, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

Introduction

Founded in 1925 by the British colonial government, The Rubber Research Institute of Malaysia, Kuala Lumpur (RRIM)'s mission was to provide scientific and technical support to the then-booming Malayan rubber plantation industry. At the time, Malaya (now Malaysia) was the world's largest producer of natural rubber, a commodity of immense strategic importance (Drabble, 2000).

The Institute's key historical contributions include the development of high-yielding rubber clones.Through selective breeding, they created trees that produced significantly more latex than unselected seedlings. The RRIM 600 series of clones, developed in the post-war era, became the global gold standard, dramatically increasing plantation productivity (Bauer, 1948).

RRIM researched and developed methods to combat diseases like Ganoderma root rot and pests that threatened the industry. It established standardized grading systems and testing methods for rubber, ensuring Malaysian rubber met international quality benchmarks: this built trust and a premium brand for the product. RRIM served as the central hub for training planters, estate managers, and researchers, disseminating best practices across the industry (Malaysian Rubber Board, n.d.).

Essentially, the RRIM provided the scientific foundation that allowed the Malayan (and later, Malaysian) rubber industry to dominate the world market for decades.



Figure 3: Central porch of front facade of Rubber Research Institute of Malaysia along Jalan Ampang, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

Evolution of RRIM into the Malaysian Rubber Board (MRB)

In 1998, RRIM was restructured and incorporated into the Malaysian Rubber Board (Lembaga Getah Malaysia), which conserves the legacy on a broader scale (Malaysian Rubber Board, n.d.)

The MRB continues the core mission of R&D, but its focus has expanded far beyond just latex production. Key areas now include developing and promoting specialized rubber products such as engineering components, medical devices (e.g., surgical gloves, catheters),

and automotive parts. MRB implements the Malaysian Sustainable Natural Rubber (MSNR) certification to ensure environmentally and socially responsible production, which is crucial for modern markets. It researches into the use of rubberwood (the timber from felled rubber trees) and other by-products for furniture and biomass energy, promoting a circular economy (Malaysian Rubber Board, 2020).

While Malaysia is no longer the world's top producer of raw rubber (surpassed by Thailand and Indonesia), it remains a global leader in the manufacturing of rubber products, especially latex gloves and rubber threads. The MRB's research underpins this high-value downstream segment of the industry (International Rubber Study Group, 2022).

Through its testing laboratory (SMRL), the MRB establishes benchmark standards for technically specified rubber, like SMR (Standard Malaysian Rubber), which is traded internationally (Malaysian Rubber Board, n.d.).



Figure 4: Part view of front facade of Rubber Research Institute of Malaysia along Jalan Ampang, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 5: Main Entrance of Rubber Research Institute of Malaysia. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 6: Location plan of Rubber Research Institute of Malaysia complex. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 7: Facade of Main Laboratory with rolled rubber sheets as decorative emblem. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

The 1930s Heritage Building and Complex

The core buildings of the RRIM, located on Jalan Ampang, Kuala Lumpur are good examples of Art Deco architecture adapted to the tropics (see Figures 2, 3, 4, 5 and 6). Designed by architect Arthur Oakley Coltman of Messrs Booty Edwards & Partners, Architects, the main administrative building, completed in 1936, is a classic piece of British colonial architecture with strong Art Deco influences. This is seen in its clean, geometric lines, symmetrical facade, and streamlined appearance, a departure from the more ornate styles of the earlier colonial period (Leong Y, Soon S, Powell R, Hasnan L. (eds.), 2021) (see Figures 7, 8, 9 and 10).



Figure 10: Bas-relief panel featuring Sir Henry Wickram who brought rubber seeds from Brazil to London. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 8: Front view of decorative plaster bas relief panels of façade. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 11:View inside a covered corridor of inner courtyard. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 9: Detail of bas relief panel highlighting the rubber industry products of tyres. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 12: View of a covered corridor from inner courtyard. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 13: View of rear courtyard buildings with a newer block on the left. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 14: View of inner courtyard with shady trees and a newer block on the right. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

The design is perfectly suited for the tropical climate with key features, including wide verandahs and overhanging eaves to provide shade and protect the interiors from sun and rain. High ceilings were incorporated to promote air circulation in a pre-air-conditioning era. Louvred windows enabled adjustable ventilation. The building had the common feature of raised foundations to mitigate dampness and improve airflow underneath the building (Chen, 1998) (see Figures 11, 12, 13, 14, 15, and 16).

The institute was designed as a self-contained campus with laboratories, experimental stations, and staff quarters, which created a dedicated environment for scientific research. The surrounding suburban lush greenery was then part of the conducive setting, which however, has since disappeared with the subsequent urban development of Kuala Lumpur (Badan Warisan Malaysia, n.d.).

The iconic 1930s building complex is a monument to the scientific and administrative rigour that built the Malayan rubber industry. It symbolizes a time when agricultural science was a primary driver of the national economy. It stands as a gazetted heritage building (2009) of Kuala Lumpur, valued for its architectural and historical significance. While the main research facilities have relocated elsewhere in Kuala Lumpur, e.g. the MRB headquarters in Sungai Buloh, the original site provides a tangible link to the city's and the nation's industrial heritage (Kuala Lumpur City Hall (DBKL) (2014). To conserve these listed historic buildings properly, a sympathetic and competent conservation architect should be appointed to do an appropriate adaptive reuse of them.



Figure 15: Side view of Main Laboratory. The Rubber Research Institute of Malaysia is one of the few remaining authentic Art Deco buildings in Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 16: Side view of Main Laboratory of the Rubber Research Institute of Malaysia. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

References:

Badan Warisan Malaysia (n.d.). Architectural Heritage. [online] Available at: https://badanwarisan.org.my/

Bauer, P.T. (1948). The Rubber Industry: A Study in Competition and Monopoly. London: Longmans, Green and Co.

Chen, V. (ed.) (1998). The Encyclopedia of Malaysia, Vol. 5: Architecture. Singapore: Archipelago Press.

Drabble, J.H. (2000). An Economic History of Malaysia, c.1800-1990: The Transition to Modern Economic Growth. Basingstoke: Macmillan Press.

International Rubber Study Group (2022). Rubber Statistical Bulletin. [online] Vol. 77, No. 7-9. London: IRSG.

Kuala Lumpur City Hall (DBKL) (2014). Kuala Lumpur Structure Plan 2020. Kuala Lumpur: DBKL.
Malaysian Rubber Board (n.d.). History. [online] Available at: http://www.lgm.gov.my/about/history

Leong Y, Soon S, Powell R, Hasnan L. (eds.) (2021). BEP 100 – BEP Akitek Sdn Bhd 1921-2021: Adaptus Design System Sdn Bhd.

Malaysian Rubber Board (2020). Annual Report 2020. [online] Available at: http://www.lgm.gov.my/publication/ar2020/

Floating Tin Dredges of Malaysia: Tanjung Tualang Tin Dredge n° 5 (TT5) in Batu Gaja (Perak) and Sri Danting Dredge in Dengkil (Selangor)

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Extraction



Figure 1: Tanjung Tualang Tin Dredge No. 5 (TT5). Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

Introduction

The tin mining industry in Malaysia has a history spanning over two centuries, with its origins dating back to the 1820s in Perak, and 1824 in Selangor (Yip, 2021). This period marked the foundation of a major economic pillar for Malaya, and attracted significant Chinese migration to work in the mines.

Brief history

The early development of the tin industry ranged from 1820 to 1900. Then, the Kinta Valley of Perak was a major driver of economic growth, attracting both capital and labour, primarily Chinese immigrants (Sullivan and Hassan, 2008). The 19th century saw the industry flourish with European companies eventually taking a dominant role, especially in the early 20th century, due to the injection of capital, technology, and managerial expertise (Yip, 2021).

Pre-WWII Malaya was a significant tin producer, supplying a substantial portion of the world's tin, particularly to Europe. The post-WWII period, however, saw the industry face significant challenges, including falling tin prices and increased competition, which led to a decline in production and the closure of several mines (Sullivan and Hassan, 2008). By the late 20th century, many mines in the Kinta Valley and other areas had been abandoned, reflecting a more general move away from tin mining. Despite the decline, tin mining left a significant historical and cultural imprint on Malaysia, particularly in areas like Ipoh, Kampar, and Batu Gajah in Perak (Department of Museums Malaysia (2016), which were once bustling tin mining towns (see Figure 2).

While today the industry is not as robust as in the past, Malaysia remains a producer of tin, with companies like Rahman Hydraulic Sdn Bhd still engaged in large-scale mining.

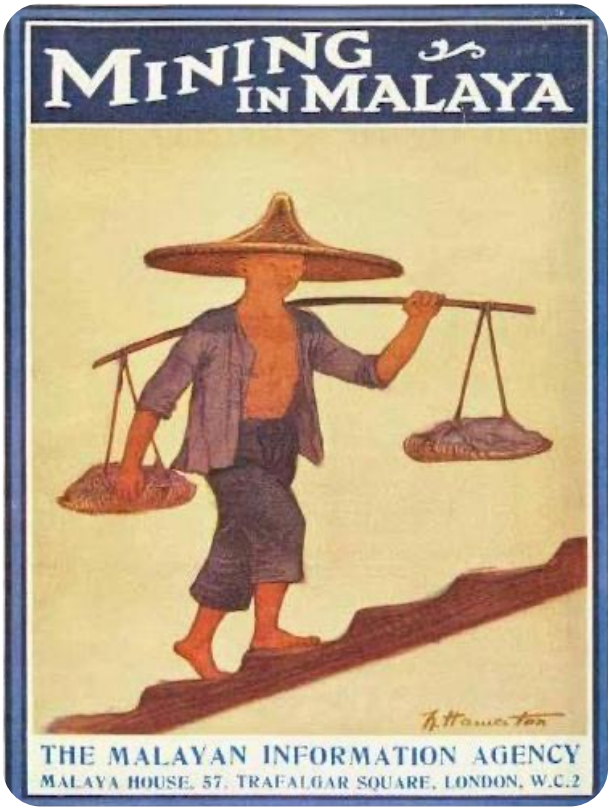


Figure 2: Magazine cover of 'Mining in Malaya'. Source: Harris, H. G., MacDonald, A. G. and Willbourn, E. S. (1940). (Cover of) Mining in Malaya. Source: Kuala Lumpur: Malayan Information Agency.

Tin Mining Methods

In the late 1800s and early 1900s, Chinese miners used panning or dulang washing technique to collect tin residue from the earth. When the British started mining in Malaysia, they realised this method of extracting the resource was too laborious and time-consuming, and could not cater to the huge demand at that time (Khoo and Yunus, 2017).

Another popular method back then was the open-cast mining method of tin ore, where a sink, which functions as a sluice-box or palong, was placed upon wooden scaffolding. This was used in conjunction with the gravel-pump mining method, where a high-pressure stream of water was used to break down rocks containing tin ore. Then a gravity pump lifted this mixture into the trough or sink, for separation from the tin ore. Later, a more advanced way for tin separation was introduced via a tin dredge, the 'mechanical monster' of the mines (Sullivan and Hassan, 2008).

Tin ore is refined by heating it with carbon (coal or coke) in furnaces at temperatures ranging from 1,200°C to 1,400°C to produce crude tin metal. The molten tin is then tapped from the furnace and cast into large ingots weighing about 34 kg for transportation (see Figure 1).

The first dredges were introduced in 1913 in the Kinta Valley area, and their numbers grew rapidly as tin mining expanded. At the peak of the tin-mining era, by the late 1930s and early 1940s, around 104–123 dredges were operating across Malaya. Of all these structures, today only two heritage remnants of the tin mining industry of Malaysia remain. These are the mining dredges located at Batu Gajah, Kinta District, Perak, which are called the Tanjung Tualang Tin Dredge No. 5 (TT5), and the Sri Banting Dredge located near Dengkil in Selangor.

Tanjung Tualang Tin Dredge n° 5 (TT5)

TT5 dredge was built in England in 1938 by a major dredge engineering company called F.W. Payne & Son. It was constructed for the Southern Malayan Tin Dredging Ltd., a company formed in 1926, which in total operated 6 dredges in Batu Gajah and Tanjung Tualang (Department of Museums Malaysia, 2016). Weighing 4,500 tons, TT5 is supported by a 75-metre-long floating dock, 35 metres in width, and 3 metres in depth. The machinery was used for 44 years until 1982, when the Malaysian tin industry declined due to falling world tin prices, exhausted tin deposits, and high operating costs. Of the 123 dredges scattered throughout Malaya, TT5 was the only one that operated for that long, and it is also the oldest one that remains.

The floating dredge was subsequently converted into a mining museum. In January 2015, the area underwent a RM8.5 million renovation over 2 years (Ahmad, 2019) (see Figures 1, 3, 4, and 5).



Figure 3: Tanjung Tualang Tin Dredge No. 5 (TT5). Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

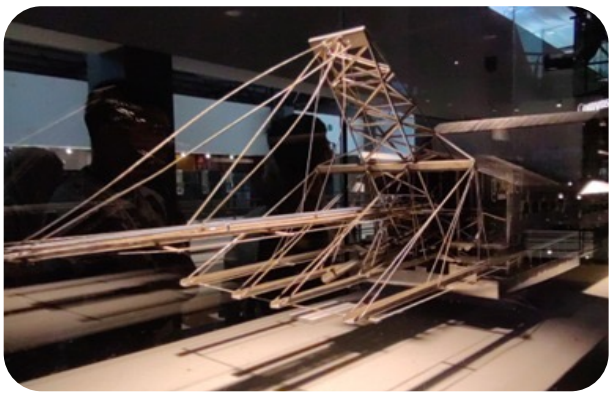


Figure 4: Tin Dredge Model at Tin Mining Museum at Royal Selangor Visitors Centre. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

Today, visitors can walk inside the dredge and see the original machinery, control rooms, and living quarters used by workers. The site provides valuable insights into how tin dredging worked and the daily lives of miners. TT5 stands as an important symbol of Malaysia's mining heritage and serves as a successful example of industrial conservation and heritage tourism.

Sri Banting Dredge

The Sri Banting Dredge was built in 1974 and began operating in the late 1970s during the final years of Malaysia's tin-mining industry.

'The 5,000-tonne structure, which was reportedly the largest dredge in the world, is part of Selangor's tin mining legacy. The electric-powered structure measures 86m in length and between 22m and 29.3m in width. It is equipped with 110 buckets and was capable of digging to a 30m depth.

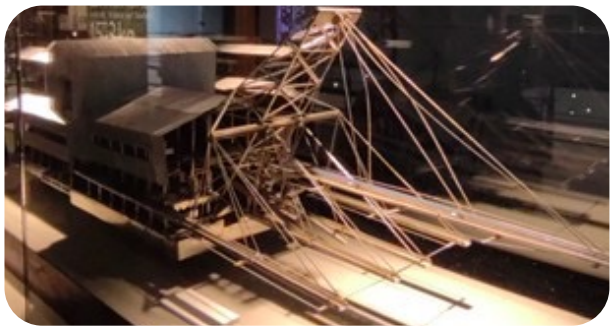


Figure 5: Tin Dredge Model at Tin Mining Museum at Royal Selangor Visitors Centre. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 6: View of Sri Banting Tin Dredge at Dengkil, Selangor. Photograph from Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

The restoration of the dredge, built in 1974, forms part of the construction of the 48.79ha national tin mining heritage park' (Nair, 2025) (see Figure 6).

After it stopped working, the dredge was left unused for many years and slowly deteriorated. In 2025, the Selangor government and the Tourism, Arts and Culture Ministry of Malaysia allocated RM13 million to restore the structure (Nair, 2025). Steps are being taken to preserve and restore the dredge as part of a future 48.79ha National Tin Mining Heritage Park (Nair, 2025). Once restored, the Sri Banting Dredge is expected to serve as an educational and cultural landmark, helping future generations understand Malaysia's industrial and economic history.

References:

Ahmad, A. (2019). Industrial Heritage Tourism in Malaysia: The Case of the Tanjung Tualang Tin Dredge. Journal of Heritage Tourism, 14(3), pp. 245-259.

Andaya, B. W. (2020). The "knowledge economy" and tin mining in 19th-century Malaya.

Asian Studies Department, University of Hawai'i. [online] Available at: https://www.ehm.my/publications/articles/the-knowledge-economy-and-tin-mining-in-19th-century-malaya

Caving Liz (2020). Tin dredge at Dengkil, Selangor. [online] Available at: https://cavinglizsea.blogspot.com/2010/12/tin-dredge-at-dengkil-selangor_20.html cdulu (2023).

Tanjung Tualang Tin Dredge No. 5 (TT5): Malaysia's Last Tin Dredge. [online] Available at: https://www.cdulu.com/blog/tanjung-tualang-tin-dredge-kapal-korek

Department of Museums Malaysia (2016). National Heritage Register - Tualang Dredge No. 5. [online] Available at: https://www.jmm.gov.my/en/ [Accessed 23 Oct. 2023].

Harris, H. G., MacDonald, A. G. and Willbourn, E. S. (1940). Mining in Malaya. Kuala Lumpur: Malayan Information Agency.

Khoo, T.C. and Yunus, R. (2017). A History of Malaysian Tin Mining. Selangor: Universiti Malaya Press.

The Star (2025). Dengkil tin mining dredge being inspected before restoration. [online] Available at: https://www.thestar.com.my/metro/metro-news/2025/05/28/dengkil-tin-mining-dredge-being-inspected-before-restoration [Accessed 13 Oct. 2025].

Sullivan, M. and Hassan, N. (2008). The Kinta Valley: A History of the Tin Mining Industry. Ipoh: Perak Academy.

Yip, Y.H. (2021). The Tin Industry in Malaysia. Singapore: NUS Press.

Sungai Lembing Tin Mine and Town

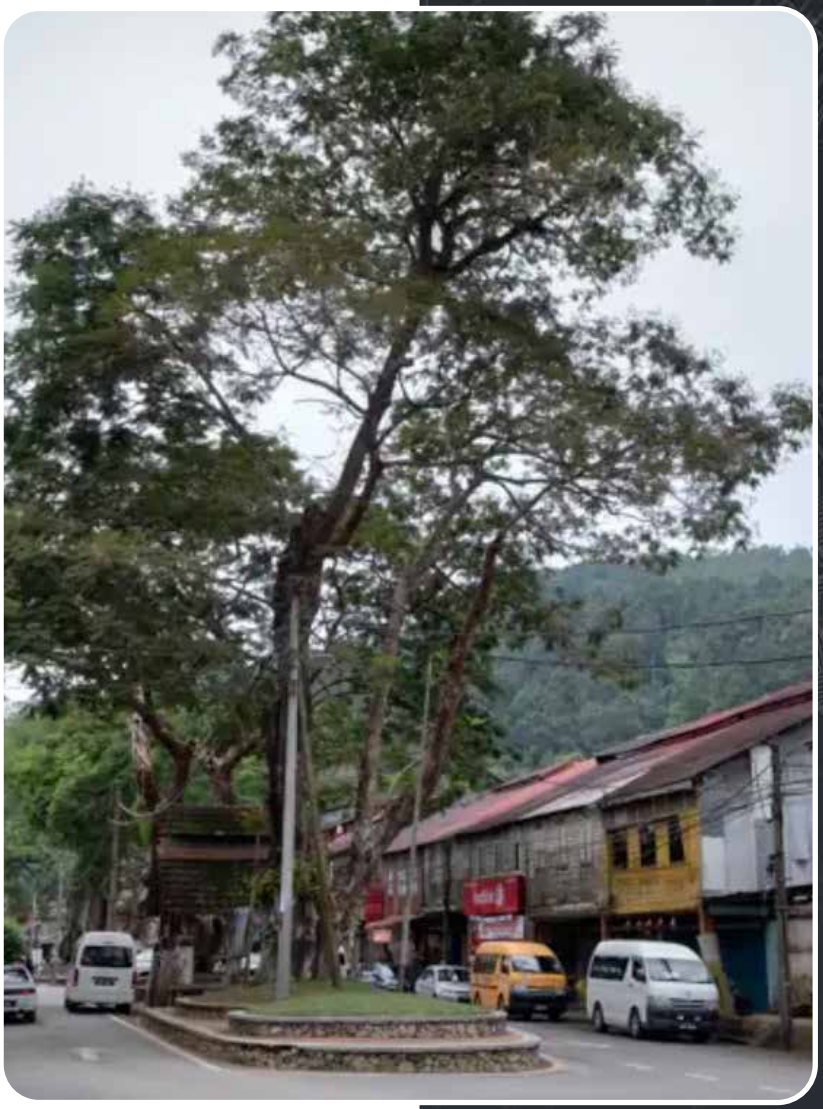


Figure 1: View of the main street of the former mining town of Sungai Lembing in Pahang. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Extraction, Industrial Communities

Significance and Relevance as an Industrial Heritage Site

Tin was a primary pillar of the Malayan economy, and Sungai Lembing Tin Mine was its most productive mine. It contributed directly to Malaysia's status as the world's largest tin producer for much of the 20th century (Yip, 2009). The mine's history encapsulates the colonial era of resource extraction, the development of a local working-class identity, and its eventual transition into a post-industrial Malaysian heritage asset.

History and Background

While small-scale mining existed earlier, modern industrial mining began in 1886 after the Pahang Consolidated Company Limited (PCCL), a British entity, secured a long-term lease from the Sultan of Pahang to mine tin in Pahang (Khoo and Lubis, 2005).

This tin mine earned the nickname of 'El Dorado of the East' due to its immense richness. It also became the largest and deepest underground tin mine in the world. It operated a tunnel network comprising over 322 km (200 miles) of underground tunnels, often described as an 'underground city'. Depths reached up to 700 meters (2,300 feet) below the surface, equivalent to a 200-storey building (Sungai Lembing Museum, n.d.). At its peak, it employed a workforce of over 1,500 workers, supporting a town population of over 10,000 with comprehensive facilities (Khoo and Lubis, 2005). The mine was forced to close in 1986 due to a catastrophic collapse in the global tin price, ending a century of operation and plunging the town into economic hardship.

Technological and Engineering Significance

Sungai Lembing Tin Mine pioneered advanced mining techniques for its time. It utilised the 'Sungai Lembing Method' (a variation of the stope caving method), which was highly efficient for deep-level mining (Department of Minerals and Geoscience Malaysia, 2010). The mine infrastructure featured an extensive network of elevators (cages), electric locomotives, ventilation systems, and a dedicated hydroelectric power station—technologies that were cutting-edge in colonial Malaya. The sheer depth and sprawling tunnel network represent a monumental achievement in civil and mining engineering at that time.
Sungai Lembing was a classic example of a mining 'company town'. The PCCL provided not only jobs but also housing, a hospital, a school, a cinema, and



Figure 2: View of the main street of the former mining town of Sungai Lembing in Pahang. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

recreational facilities, creating a unique socio-cultural ecosystem (Khoo and Lubis, 2005). The workforce comprised Malay, Chinese, and Indian workers, making the town a microcosm of Malaysia's multicultural society, forged through mining labour. Sungai Lembing town represents the livelihood, struggles, and community spirit of generations of miners and their families. This associated intangible heritage is also a crucial part of Malaysia's social history (see Figures 1 and 2).

Architectural and Landscape Significance

The subterranean landscape of mine tunnels is the primary architectural feature, a man-made marvel carved deep into the earth.

The town retains instead a significant number of original heritage elements that grant it a distinctive architectural character. These include the former General Manager's bungalow (now the Sungai Lembing Museum), rows of miners' quarters, and other colonial-era administrative buildings.

On this account, the site is recognised in practice as a heritage tourism destination within Pahang and Malaysia due to its historical tin mining significance and preserved engineering features associated with the mining activity and surrounding architectural structures.

Overall, the historic relic of the Sungai Lembing Tin Mine is a symbol of Malaysia's pivotal role as the world's largest producer of tin in the late 19th and 20th centuries (Yip, 2009).

Recognition as an Industrial Heritage Site
In spite of its recognised heritage value, the mine would benefit from formal heritage listing. Tangible benefits would consist of enriching its narrative associated with tin mining with elements telling a story of industrial innovation, human endeavour, and economic transformation. With heritage status, Sungai Lembing Tin Mine and town will have a legal and administrative framework to protect the site from unsympathetic development, decay, vandalism, or even unfortunate occurrences alone. This was highlighted after a fire in 2019 had destroyed part of the historic town centre, including an archival museum (The Star Newspaper, 2019).

The Sungai Lembing Tin Mine is a monumental industrial site that tells a powerful story of geological wealth, technological ambition, and social history. The complex de facto serves as an open-air museum and educational resource, and is already a critical element for enabling current and forthcoming generations to tangibly understand a critical chapter of national history.

Cultural and history-focused tourism thus provides a pathway for a sustainable economic future for the town of Sungai Lembing, one that mirroring its past economic role. Formal listing would solidify the mine's role as a cornerstone of modern Malaysian history, and also set a precedent for how Malaysia could recognise, conserve, and promote its other industrial heritage sites.

In a forward-looking development, a 2014 architectural thesis student Chia Yao-Qing from the University of Malaya proposed an imaginative design for the Sungai Lembing Cultural Museum. The concept envisions constructing the museum above ground while extending downwards to integrate some of the underground spaces of the historic mine. This innovative entry received a commendation at the Royal Institute of British Architects (RIBA) Silver Medal Award 2024 (see Figures 3 – 7).

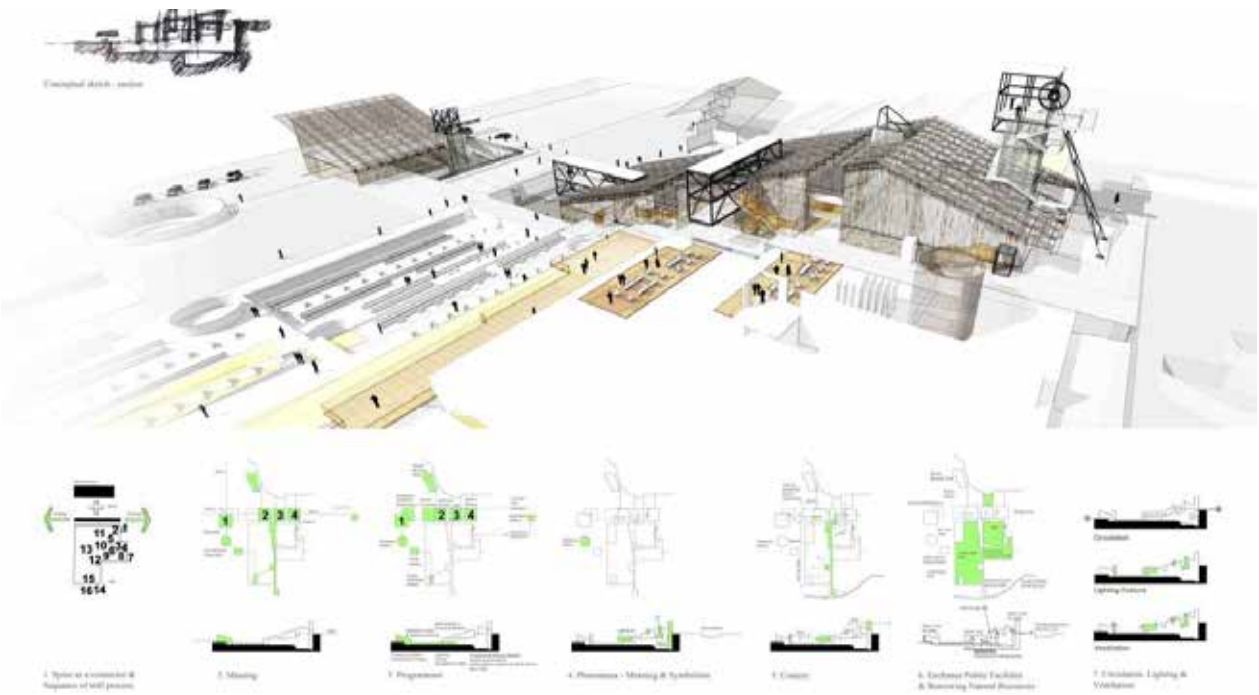


Figure 3: Design Strategies of proposed Sungai Lembing Cultural Museum. Author: Chia, Yao-Qing (2014). CC-BY-SA 3.0 IGO



Figure 4: Site & Location Plan of proposed Sungai Lembing Cultural Museum. Author: Chia, Yao-Qing (2014). CC-BY-SA 3.0 IGO



Figure 5: Site Layout Plan of proposed Sungai Lembing Cultural Museum. Author: Chia, Yao-Qing (2014). CC-BY-SA 3.0 IGO



Figure 6: Longitudinal Section of proposed Sungai Lembing Cultural Museum. Author: Chia, Yao-Qing (2014). CC-BY-SA 3.0 IGO



Figure 7: Overall Perspective View of proposed Sungai Lembing Cultural Museum. Author: Chia, Yao-Qing (2014). CC-BY-SA 3.0 IGO

References:

Competition Entry of Sungai Lembing Cultural Museum, Malaysia for RIBA Silver Medal Award 2014, which received a Commendation. Available at: https://www.presidentsmedals.com/Entry-36461

Department of Minerals and Geoscience Malaysia, 2010. Tin Mining in Malaysia. [online] Available at: <http://www.jmg.gov.my> [Accessed 12 October 2023].

Khoo, T.C. and Lubis, A.R., 2005. Sungai Lembing: Heritage of a Tin Mine. Penanduk Publications.

The Star Newspaper, 2019. Fire destroys part of Sungai Lembing museum. [online] Availble at: https://www.thestar.com.my/news/nation/2019/08/31/elderly-couple-killed-in-sg-lembing-fire-was-preparing-for-son039s-wedding

Sungai Lembing Museum, n.d. Exhibition Placards and Museum Guides. Sungai Lembing, Pahang.

Yip, Y.H., 2009. The Development of the Tin Mining Industry of Malaya. University of Malaya Press.

Royal Selangor: a Legacy Cast in Pewter



Figure 1: Worlds's largest pewter tankard (capacity: 2796 litres) at Royal Selangor Visitor Centre, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Metallurgy

Introduction
Royal Selangor transcends its identity as a mere pewter company; it is a cultural institution deeply embedded in the Malaysian industrial narrative. Its story is a chronicle of craftsmanship, entrepreneurial spirit, and cultural evolution, making it a paramount example of the nation's living industrial heritage.



Figure 2: Royal Selangor's heritage pewterware with Art Deco details. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

A Brief History: From Kuala Lumpur Pewtersmith to Global Brand

The legacy began in 1885 with Yong Koon, a 14-year-old Chinese immigrant pewtersmith. Establishing his shop, Ngeok Foh (Jade Peace), in Kuala Lumpur, he catered to the local community by handcrafting practical and ceremonial items such as joss stick holders, incense burners, and tea caddies for Chinese households and temples (Chen, 2003). His work laid the foundation of a craft tradition in British Malaya. The business, then known as Selangor Pewter, passed to his son, Yong Shoon Lin, in the early 20th century (see Figure 2).

Navigating the challenges of the World Wars and the Great Depression, the company found a significant new market by supplying ashtrays and tankards to the British Empire's officers and clubs, thereby establishing a reputation for fine quality and durability (see Figures 3 and 4). The post-WWII era and Malayan Independence (1957), followed by the formation of Malaysia (1963), marked a period of modernization under the third generation. Amidst a wave of nascent nationalism, Selangor Pewter evolved from a local supplier into a symbol of national pride and craftsmanship.



Figure 3 and 4: Modern reproductions of earlier Royal Selangor heritage pewterware designs are available for sale. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

A pivotal moment came in 1979 when Sultan Salahuddin Abdul Aziz Shah of Selangor granted the company a royal warrant, leading to its rebranding as Royal Selangor. This endorsement cemented its status as a standard of quality.

The company's transformation into a global design powerhouse was driven by the fourth generation, led by Yong Poh Kon. He shifted the emphasis from purely functional items to high-design pieces, recruiting international talent to create modern, artistic collections. The iconic tankard and elegant tableware became global status symbols. This design revolution, coupled with aggressive global expansion in the 1970s, successfully transformed the local SME into an international luxury brand.

Today, as the world's largest pewter brand, Royal Selangor continues to innovate through collaborations with renowned designers (e.g. Erik Magnussen and Freeman Lau) and pop culture franchises (e.g. Lord of The Rings and Star Wars), all while honouring its core heritage (Royal Selangor, n.d.) (see Figures 5 and 6). The Royal Selangor Visitor Centre in Setapak, Kuala Lumpur stands as a major tourist attraction and a physical testament to this remarkable journey.

Significance as a Narrative of Malaysian Socio-Economic Development

Royal Selangor's true significance lies in its role as a mirror to Malaysia's own socio-economic development, representing a unique and enduring facet of the national identity.

In an age of mass production, Royal Selangor serves as a custodian of traditional metalworking skills. Artisanal techniques like sand-casting, spinning, and hand-planishing are preserved and practiced by master craftspeople, ensuring this living craft heritage is passed down through generations.

The company's evolution—from a one-man cottage industry in the colonial era to a modern corporate giant in a globalized world—perfectly encapsulates Malaysia's own economic journey in microcosm. It exemplifies how a family business can adapt and thrive through shifting political and economic landscapes.

For decades, Royal Selangor has been the benchmark for authentically Malaysian quality and luxury, lending much national pride and identity. Its products are frequently chosen as official state gifts and awards, representing the nation on the world stage. Furthermore, by incorporating cultural motifs from





Figure 5 and 6: Melon-shaped teapot made by Royal Selangor's founder Yong Koon in 1885, and its modern reproduction is available in the sales catalogue. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO





Figure 7 and 8: At the polishing station, where cups were lathe turned and buffed to a smooth shine. Planishing for texture is done at another workstation. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

songket textiles, the cempaka flower, and local wildlife like the hornbill, the company translates national symbols and acknowledged features of Malaysia identity into tangible, beautiful objects.

The Royal Selangor Visitor Centre in Kuala Lumpur functions as an interactive museum of industrial heritage. It explains and popularises the production process and, through its renowned 'School of Hard Knocks' workshop, provides a hands-on connection to the craft of planishing (see Figures 7, 8 and 9). This public engagement educates both Malaysians and international visitors, fostering a deeper appreciation for this unique aspect of the nation's industrial and also artistic history (see Figure 10).

Conclusion

From its humble beginnings in a Kuala Lumpur shop to its current status as a globally recognised brand, Royal Selangor's story is intrinsically linked with that of Malaysia. It is not just a company that makes pewter; it is an institution that has preserved heritage, fueled national pride, and narrated the story of a nation's progress. Its legacy is, indeed, cast in pewter and engraved into the cultural soul of Malaysia.

References:

Chen, M.Y. (2003) The Royal Selangor Story: Born and Bred in Pewter Dust. Singapore: Archipelago Press.

Royal Selangor (no date) Collaborations. [online] Available at: https://www.royalselangor.com/intl/collaborations.



Figure 9: Factory floor at Royal Selangor Visitor Centre, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO



Figure 10: Worlds's largest pewter tankard (capacity: 2796 litres) at Royal Selangor Visitor Centre, Kuala Lumpur. Photograph by Take Bane Lim (2025). CC-BY-SA 3.0 IGO

The Textile Weaving Traditions of the East Coast



Figure 1: Weaving at the hand loom at home. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Textiles

Introduction

The east coast states of Peninsular Malaysia (Kelantan, Terengganu, and Pahang) is the heartland of traditional Malay weaving. The region's rich history as a trade hub, its royal courts (istana culture), and its access to fine materials like gold and silver thread fostered the development of these classic textiles. They are not just fabric; they symbolise Malay identity, status, and artistry (Jabatan Muzium Malaysia, 2009).

Key Weaving Techniques & Traditions

Songket is the most famous and prestigious of Malaysian textiles. It employs a supplementary weft weaving technique where additional threads of gold, silver, or coloured silk are woven into the base fabric (usually silk or cotton) to create intricate, shimmering patterns. The weaver uses a *sesiku* (a small bone tool) to pick the warps manually and insert the decorative threads. Songket is known for its opulence and complexity. Traditional motifs are inspired by nature: *bunga tabur* (scattered flowers), *bintang* (stars), *pucuk rebung* (bamboo shoots), and Islamic geometry. Songket weaving is officially recognised as a National Heritage Object under Malaysia's National Heritage Act 2005 (Jabatan Muzium Malaysia, 2009) (see Figures 1 and 2).

Tenun means 'to weave' in Malay, and is a broad term for plain weave textiles. It is often used to refer to distinctive checked or striped fabrics. It is a basic weave creating patterns through the strategic threading of coloured warps and wefts. It does not use the supplementary weft technique of songket. Tenun is known for its bold, geometric patterns, often in vibrant colours. The classic *sarung tenun* (woven sarong) is a staple of Malay traditional dress. The state of Pahang is particularly renowned for its *tenun Pahang* (or kain tenun Pahang), which often



Figure 2: Weavers at their hand looms in a local factory. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO

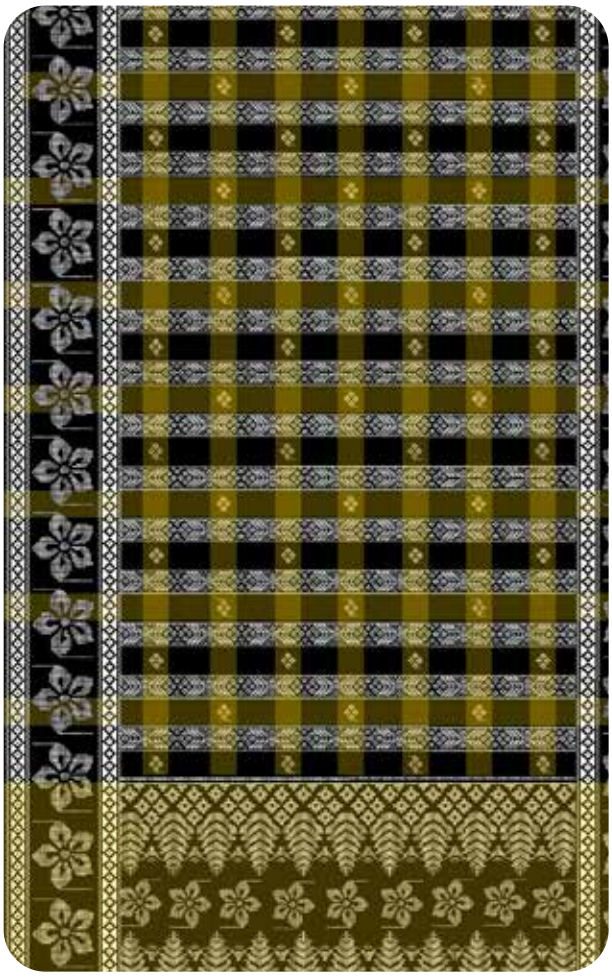


Figure 3: Woven textile from Pahang with Pekan flower motifs. Photograph by Auhamad Fazil (2025). CC-BY-SA 3.0 IGO



Figure 4: Woven textile from Pahang with detail of stylized Pekan flower motifs. Photograph by Auhamad Fazil (2025). CC-BY-SA 3.0 IGO

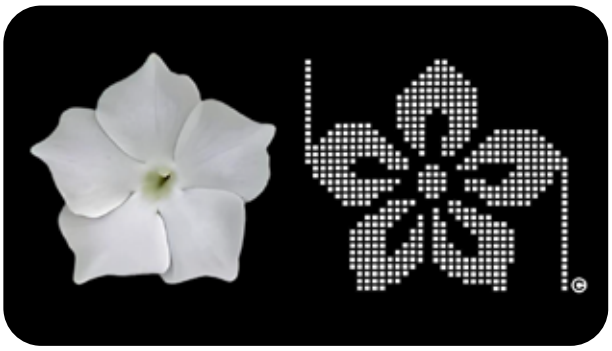


Figure 5: Woven textile from Pahang with design detail of a Pekan flower stylized into a floral motif. Photograph by Auhamad Fazil (2025). CC-BY-SA 3.0 IGO



Figure 6: Woven textile from Pahang with design detail of 4 Pekan flowers stylized into a geometric floral motif. Photograph by Auhamad Fazil (2025). CC-BY-SA 3.0 IGO

features signature motifs like the *pucuk rebung* (bamboo shoots) and striped patterns. Tenun Pahang is also the broad term for loom weaving (Sheppard, 1972) (see Figure 3).

While less predominant than in neighbouring Indonesia, the ikat technique exists in the Malaysian tradition, often blending with others. Ikat is a resist-dyeing process performed before weaving. Threads (either the warp or weft) are tied and dyed in specific patterns. When woven, the pre-dyed patterns emerge into a blurred or 'feathered' design. The patterns have a characteristic soft, hazy edge. In the Malaysian context, ikat-dyed threads were sometimes incorporated as the base for songket weaving, creating a highly valuable and complex textile (Fraser-Lu,1988).

Limar is a specific and highly prized sub-category that combines the ikat and songket techniques. It is considered the pinnacle of Malay weaving artistry. The warp threads are ikat-dyed to create a soft, patterned background. Songket supplementary weft threads (gold/silver) are then woven over this ikat base to add dense, shiny patterns. The result is a breathtaking textile with a deep, blurred background pattern in contrast to sharp, metallic motifs. Authentic limar is extremely rare, expensive, and time-consuming to produce. It was historically reserved for royalty and the nobility (Siti Zainon Ismail, 2006).

The weaving industry in these states is a classic example of a craft-based industrial heritage. It evolved from a cottage industry practised in village homes to a more organised sector, often supported by royal patronage and, later, government intervention (Noor and Khoo, 2003). The northeastern states of Kelantan and Terengganu are the undisputed powerhouses, especially for songket. Key heritage centres include the Craft Cultural Centre (Balai Besar) in Kuala Terengganu, a major hub. Kampung Losong is famous for its concentration of songket weavers. Kampung Penambang and Kampung Budaya in Kota Bharu, Kelantan, are renowned weaving villages. Pahang state is known for its distinctive tenun Pahang, and the industry is centred in areas like the royal town of Pekan and Beserah (See Figures 4, 5, and 6)..

This heritage is 'industrial' not because of mass machinery, but due to its organised production, economic significance, and the ecosystem of artisans, suppliers (of silk, gold thread), and distributors it supports (Noor and Khoo, 2003).

Challenges and Preservation as a Living Heritage

This precious industrial heritage faces significant challenges. The declining number of master weavers *(tukang tenun)* as the skill is arduous to learn, which requires years of patience and dedication. Younger generations often seek less demanding, more lucrative careers. The competition from cheap

machine-made imported fabrics from other countries, which mimic the look of songket and tenun at a fraction of the cost, is threatening the market for authentic, handwoven pieces. The high cost of materials drives up the price of authentic pieces, as genuine gold and silver thread and high-quality silk are expensive. There is also the time-consuming process to weave a single high-quality songket sarong which can take a weaver several months to complete. State government agencies such as Kraftangan Malaysia (Malaysian Handicraft Development Corporation) and royal families' patronage help preserve the craft by providing training, marketing support, and quality certification, such as the *Pewarna* label for authentic handicrafts (Kraftangan Malaysia, 2021). Local designers are modernizing, adapting, and innovating by employing songket and tenun in contemporary fashion (e.g., dresses, jackets, ties, handbags), helping to create a new market and making the tradition relevant to modern consumers. Weaving centres are key cultural tourism attractions, providing visitors with demonstrations and opportunities to purchase directly from artisans, creating vital income. The inscription of *Songket* in 2021 on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity is raising the profile and support for its future preservation.

Conclusion

The weaving traditions of tenun, ikat, songket, and limar of Kelantan, Terengganu, and Pahang are a grand and enduring industrial heritage. They represent a seamless blend of artistic mastery, cultural identity, and economic activity. While facing modern challenges, they are being sustained through a combination of craftsmanship, cultural pride, and strategic adaptation, ensuring that this golden thread of Malay culture continues to weave its story for future generations.

References:

Fraser-Lu, S. (1988). Handwoven Textiles of South-East Asia. Singapore: Oxford University Press.

Jabatan Muzium Malaysia (2009). Warisan Kraf Tenunan Melayu. Kuala Lumpur: Department of Museums Malaysia.

Kraftangan Malaysia (2021). Annual Report 2021. [online] Available at: https://www.kraftangan.gov.my/en/publication/category/annual-report [Accessed 16 Oct. 2023].

Noor, F. A. and Khoo, E. (2003). 'The Songket Heritage: The Substance and the Weave', in The Warisan Songket. Kuala Lumpur: Islamic Arts Museum Malaysia, pp. 10-25.

Sheppard, M. (1972). Taman Indera: A Royal Pleasure Ground – Malay Decorative Arts and Pastimes. Kuala Lumpur: Oxford University Press.

Siti Zainon Ismail (2006). Pakaian Cara Melayu. Bangi: Penerbit Universiti Kebangsaan Malaysia.

The Traditional Boat-building Industry of Pulau Duyung, Terengganu

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Engineering, Transport

Introduction

Pulau Duyung (Mermaid Island), specifically the area known as Duyung, is not an actual island but rather a peninsula located within the Terengganu River estuary (see Figures 1 and 2). For generations, it has been the centre of Malaysia's renowned traditional wooden boat-building industry, especially for the majestic Perahu Besar (large sailing boat) and the iconic Perahu Payang (fishing boat) (Ghazali, n.d.) (see Figures 3, 4 and 5).



Figure 1: Boats of Pulau Duyung fishing village at the mouth of the Terengganu River. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO

Industrial Heritage Significance of Malaysian Boat-Building

Historically, the boat-building tradition of Pulau Duyung represents a direct, unbroken link to the millennia-old Malay Archipelago's seafaring tradition (Mohd Zain et al., 2018). The designs are the result of centuries of evolved indigenous knowledge, perfectly adapted to local sea conditions (Nor & Mohd, 2020).

The most important aspect of the craft is that holistic cultural practice aligns with UNESCO's (2003) definition of Intangible Cultural Heritage(ICH). The esoteric knowledge is transmitted orally from master to apprentice without formal blueprints, and the process is intertwined with spiritual rituals *(pantang larang)* (Nor & Mohd, 2020).

The use of traditional joinery, such as the *pasak* (wooden dowels) instead of nails, demonstrates an exceptional level of craftsmanship (Mohd Zain et al., 2018). The boats, with their elegant lines and carvings, are objects of great beauty and artistic expression (see Figures 7 and 8). The wooden sailing boat is an iconic symbol of Terengganu and Malay maritime culture, representing values of self-reliance and community *(bergotong-royong)* (Ghazali, n.d.).

The traditional designs are studied for their hydrodynamic efficiency and sustainability, using renewable natural materials (Mohd Zain et al., 2018).

Current status and condition

The industry is a pale shadow of its former self and can be best described as critically endangered, yet culturally resilient (Bernama, 2021).

Where once there were dozens of active boat yards and master boat builders *(Tokoh or Tukang Perahu),* today, with a sharp decline in numbers, only a handful remain. A small, ageing population of about 10 master boat-builders now holds the priceless knowledge, with the average



Figure 2: Fishing boats at the mouth of the Terengganu River in Kuala Terengganu. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO



Figure 3: Hull of a traditional boat under construction. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO



Figure 4: Stern portion of the traditional boat under construction. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO



Figure 5: Stern rudder of the traditional boat under construction. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO



Figure 6: Main body of the traditional boat under construction, looking towards the prow. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO

age over 60, raising serious concerns about the transmission of skills to the next generation (Nor & Mohd, 2020).

The primary cause of decline was the advent of fibreglass (FRP) and steel-hulled boats, which are cheaper and faster to produce (Bernama, 2021). The market has changed, with the shift in primary demand now to new wooden boats coming from cultural and heritage projects, such as building replicas for museums like the Muzium Samudra (Mohd Zain et al., 2018). Tourism has become a double-edged sword. Some yards have become tourist attractions where visitors can see work in progress, providing a minor source of income but sometimes disrupting the work (Ghazali, n.d.) (see Figure 6).
The Terengganu state government and federal agencies like the Department of National Heritage (Jabatan Warisan Negara) have recognised the craft's significance and need for preservation (Jabatan Warisan Negara, 2018). Master builders have been designated as 'Living National Heritage Treasures' (Tokoh Warisan or Living Human Treasures) to incentivize them to take on apprentices (Bernama, 2021).

In summary, the industry survives due to the dedication of a few master craftsmen, niche market demand, and its irreplaceable cultural value (Nor & Mohd, 2020).



Figure 7: Stern rudder and hull of traditional boat under construction. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO

Conclusion

The traditional boat-building industry on Pulau Duyung is a critically endangered living heritage. Its survival depends on a continued combination of government support, formal recognition as heritage, and the successful transmission of irreplaceable skills to a new generation (Jabatan Warisan Negara, 2018; Bernama, 2021). It stands as a powerful testament to Malaysia's rich artisanal legacy and its deep-rooted connection to the sea.



Figure 8: Stern rudder of traditional boat under construction. Photograph by Lai, Chee Kien (2019). CC-BY-SA 3.0 IGO

References:

Bernama. (2021). Saving a dying boat-building tradition in Terengganu. The Malaysian Reserve. [online] Available at: https://themalaysianreserve.com/2021/09/06/saving-a-dying-boat-building-tradition-in-terengganu/ .

Ghazali, S. (n.d.). The Boat Builders of Pulau Duyung. [online] Tourism Terengganu. [online] Available at: https://tourism.terengganu.gov.my/en/heritage/the-boat-builders-of-pulau-duyung/.

Jabatan Warisan Negara. (2018). Senarai Warisan Kebangsaan 2018. [online] Available at: https://www.heritage.gov.my/index.php/en/senarai-warisan-kebangsaan.

Mohd Zain, O., Mohd Hussain, M.R. and Abdul Rahman, A. (2018). The Craft of Traditional Boatbuilding in Malaysia. Kertas Ilmiah, Universiti Malaysia Terengganu.

Nor, A.H. & Mohd, A. (2020). 'The Perahu Payang: Documenting the Intangible Cultural Heritage of Traditional Malay Boatbuilding in Terengganu', Journal of Maritime Studies and National Integration, 4(1), pp. 45-56.

UNESCO (2003). Text of the Convention for the Safeguarding of the Intangible Cultural Heritage. [online] Available at: https://ich.unesco.org/en/convention.

The Charchoal Kiln Factories of Kuala Sepetang, Perak

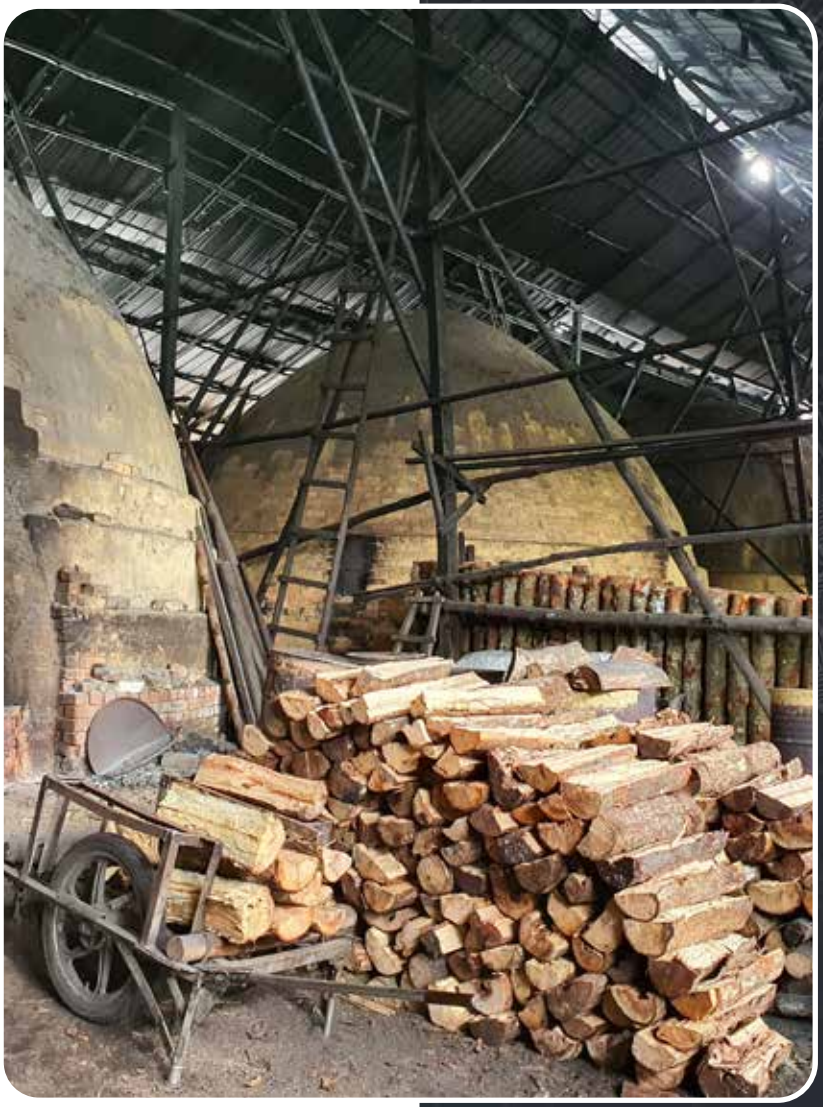


Figure 1: Stoking the fire with firewood from outside the sealed entrance of the beehive-shaped kilns. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Energy

Introduction
Located amidst the lush mangrove forests on the coastline of Perak, the century old charcoal kiln factories of Kuala Sepetang (formerly, Port Weld) Perak, stand as a testament to Malaysia's living industrial heritage. These factories with their iconic beehive-shaped brick kilns, produce premium grade charcoal from mangrove wood for export worldwide. They are a representative example of a traditional technology that embodies sustainability and ecological principles.

Historical Roots and Economic Significance

The industry's origins are deeply rooted in the early 20th century and it flourished under the British colonial administration. The demand for high-quality, clean-burning fuel for domestic and industrial use led to the systematic establishment of charcoal production facilities along the riverbanks of Kuala Sepetang, formerly known as Port Weld (JPBD, 2010) and at the estuary. For decades, this industry formed the economic backbone of the local community, providing employment for woodcutters, boatmen, and kiln workers alike. Over time its reputation for excellence grew, with premium charcoal being exported to international markets, including Japan and the Middle East, thereby establishing Malaysia as a key player in a specialised global trade (The Star, 2018).

The Art and Science of Traditional Charcoal Making

The process, largely unchanged for over a century, is almost an art form passed down through generations. It begins with the sustainable harvesting of Bakau Minyak *(Rhizophora apiculata)* from managed mangrove forests—an early example of sustainable resource management that underscores the industry's ecological awareness (Giri et al., 2011).

From the mangrove swamps, the logs are transported to the factory and carefully stacked by skilled workers inside massive, bee-hive shaped brick kilns, known as relau. The crucial carbonization process follows, where the wood is baked, not burned, at controlled temperatures for up to three weeks. The kiln doors are sealed with clay, starving the wood of oxygen and driving off moisture and volatile gases to leave behind almost pure carbon (Tan, 2021). This is followed by an equally critical cooling period before the kilns are opened to reveal the finished product: high-density, metallic-sounding charcoal ready for sorting and export. In addition to being fuel, charcoal is also used in the manufacturing industry for cosmetics, detergents, fertilisers and mosquito repellents.

Why Kuala Sepetang is an Industrial Heritage Site

The significance of Kuala Sepetang's charcoal industry extends far beyond its economic output. It is a multi-faceted heritage site for several reasons.
The beehive-shaped kilns themselves are monuments of industrial archaeology and architecture. Their distinct form and function, blackened by decades of smoke, define the visual landscape of Kuala Sepetang, and represent a vernacular industrial architecture which has adapted very well to its environment and purpose.



Figure 2: Aerial view of the mangrove forests surrounding the estuary of Kuala Sepetang, Perak. The heritage charcoal factories are to the bottom left of the photo. Source: Collection of SC Shekar (2026). CC-BY-SA 3.0 IGO



Figure 3: Mangrove forests around Kuala Sepetang. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO





Figure 4 and 5: Cut mangrove logs offloaded from the boat at the estuary. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO

The factories tell the human story of the community—of generations whose lives and identities are intertwined with the rhythm of the kilns in operation. It is a heritage of labour, skill, and community resilience (The Star, 2018). Over the years, not much has changed in the area where the charcoal factories were and still are located, namely at the river estuary facing the Straits of Malacca. Currently, the factories operating there are family-owned and run by the third generation.

Furthermore, the knowledge of traditional Chinese brick kiln construction, wood stacking, and fire management is an invaluable form of conserving intangible cultural heritage. As UNESCO (2019) emphasises, the safeguarding of such traditional craftsmanship is crucial for cultural diversity and sustainable development. Sadly, this knowledge now exists only in the hands of a dwindling number of master kiln operators.

Known threats

The charcoal-making industry currently faces significant pressures and challenges, including competition from cheaper alternatives, a declining interest in manual labour among the younger generation, and environmental scrutiny. However, its future is ironically being secured through its recognition as a heritage attraction. Tourism has introduced a new revenue stream and a platform to educate the public on its value (Tourism Perak, 2022). The way forward is certainly that the global demand for its premium, eco-friendly product remains strong, thus ensuring the economic viability of this traditional practice.

Conclusion

The charcoal factories of Kuala Sepetang, i.e. OST, Khay Hor Holdings Sdn Bhd and My (Chuan Seng) charcoal factories are an unique strand in the fabric of Malaysia's industrial heritage. They are a rare example of a living industrial tradition where history is made with every kiln that is fired. They remind us that heritage can be functional, that industry can be sustainable, and that the past can have a very tangible presence in the present. Preserving them is essential to understanding the full spectrum of Malaysia's industrial and cultural narrative.



Figure 6: Cut mangrove logs arrive by boat and are stacked neatly along the riverbanks adjacent to the factories. Photograph by Lai, Chee Kien (2010). CC-BY-SA 3.0 IGO



Figure 7: Cut logs neatly stacked outside before being put inside the kilns of the naturally-ventilated factory. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO





Figure 8 and 9: Stoking the fire at the sealed entrance of the beehive-shaped kilns. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO



Figure 10: Finished charcoal pieces on sale at shops in the vicinity. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO



Figure 11: Stacked finished charcoal ready for packing into sacks. Photograph by Foo, Anne Mei Mei (2022). CC-BY-SA 3.0 IGO

References:

Department of Town and Country Planning Peninsular Malaysia (JPBD) (2010). Rancangan Kawasan Khas Taiping Kuala Sepetang 2025 [Taiping Kuala Sepetang Special Area Plan 2025]. [online] Available at: https://jpbd.penang.gov.my/index.php/ruku-rencana/rancangan-tempatan/rt-daerah-larut-matang-selama .

Giri, C., Ochieng, E., Tieszen, L.L., Zhu, Z., Singh, A., Loveland, T., Masek, J. and Duke, N. (2011). 'Status and distribution of mangrove forests of the world using earth observation satellite data', Global Ecology and Biogeography, 20(1), pp. 154-159.

Ipoh Echo (2023) Coal Factory, The Oldest Industry In Kuala Sepetang.[online] Available at: https://www.ipohecho.com.my/2023/02/20/coal-factory-the-oldest-industry-in-kuala-sepetang/

Malay Mail (2024). Kuala Sepetang's charcoal makers ignite passion to preserve a century-old legacy. [online] Available at: https://www.malaymail.com/news/life/2024/10/01/kuala-sepetangs-charcoal-makers-ignite-passion-to-preserve-a-century-old-legacy/152105

Suntoro Tjoe (2016). The Life Journey in Photography. Charcoal Factory, Kuala Sepetang, Perak, Malaysia [online] Available at: https://suntorophotolibrary.blogspot.com/2016/05/charcoal-factory-kuala-sepetang-perak.html

Tan, T. (2021). Malaysia's last charcoal workers keep a tradition burning. Reuters, 11 November 2021. [online] Available at: https://www.reuters.com/business/cop/malaysias-last-charcoal-workers-keep-tradition-burning-2021-11-11/

Tourism Perak (2022). Kuala Sepetang Charcoal Factory. [online] Available at: https://www.tourismperakmalaysia.com/listing/kuala-sepetang-charcoal-factory/

UNESCO (2019). Safeguarding Malaysian Living Heritage. [online] Available at: https://www.unesco.org/en/articles/safeguarding-malaysian-living-heritage.

The Sayong Pumpkin (Labu Sayong) Pot



Figure 1: Labu Sayong Pot is a traditional jar used in Malaysia and shaped like a gourd. The Labu Sayong is a popular handicraft in Kuala Kangsar, Perak and is made with a special clay found in Perak. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO

Contributor:
Take Bane Lim
Design Principal, Arkitek Shilpa

Industrial classification:
Paper, Glass and Packaging

Introduction
The term 'Industrial Heritage' does not only refer to large-scale factories and steam engines. It also encompasses traditional cottage industries that demonstrate a systematic process of transforming raw materials (local clay) into a useful product (e.g., water pitcher) using specialized knowledge and techniques (Jabatan Warisan Negara, 2009). The Labu Sayong pot is a perfect example of a traditional cottage industry because of its historical geographical concentration at the Sayong district of the royal town of Kuala Kangsar, Perak, where the Sayong clay is available. The process utilises this unique local resource and involves a complex, multi-stage production process (forming, drying, firing, and smoking) which resulted in a product that was traded and had significant economic and cultural value (Ismail et al., 2018).

History and Significance

Historically, the ancient tradition of making Labu Sayong pots, which are used as water pitchers, represents a centuries-old cottage industry that has been passed down through generations in the region of Sayong, Perak. This continuity connects modern Malaysia to its pre-industrial past. It is a living heritage as the traditional methods of production are still in use today, preserving ancient knowledge and skills that are at risk of being lost forever (Yuhazmi et al., 2017) (see Figures 1 and 2).

The entire process relies on highly localized, indigenous knowledge that is specific to that region, starting with the identification and sourcing of a special type of clay found only in the Sayong area. The unique smoking and burning process using rice husks (sekam padi) is an ingenious technological innovation. This distinctive firing method not only changes the colour to black, but it also vitrifies the clay, making the pot less porous and better at cooling the water it contains (Ahmad et al., 2019). This is a sustainable technique that reuses a widely available agricultural waste product. The use of traditional methods such as coiling and pinching, instead of modern pottery wheels or industrial moulds, shows a mastery of and preservation of hand-crafting aspects (Ismail et al., 2018).

The pumpkin *(labu)* shape is not merely decorative but is also the result of functional design. The porous nature of the clay allows for natural evaporation, making the stored water pleasantly cool, even in warm temperatures, while the wide body allows for maximum water storage (Yuhazmi et al., 2017). Historically, it was an essential domestic item, serving as a natural refrigerator and water purifier for households (See Fig. 3. 4, 5 & 6). Its believed medicinal properties added to its value and demand, making it a sought-after commodity beyond its village of origin. It is used at traditional Malay ceremonies, such as weddings, where it symbolizes hospitality and blessings for



Figure 2: Labu Sayong Pot. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO



Figure 3: View with stopper resting on top. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO

the newlyweds, and also as a souvenir and decorative item (Mohamed et al., 2022). For the local community in Kampung Kepala Bendang, Sayong, this cottage industry has been and remains a vital source of income. It represents a traditional economic activity that defined the livelihood of an entire village (Mohamed et al., 2022). The industry became synonymous with the place itself, with Sayong as a famous because of the labu water pitcher. This craft put the village on the map and became an integral part of its cultural identity and pride.

Preservation of Craft for Posterity

The intricate carvings with motifs from nature (flowers, bamboo shoots, rice) are a visual archive of traditional Malay aesthetics and worldview (see Figure 7). They transform a functional object into a work of art (Yuhazmi et al., 2017). The Labu Sayong is an instantly recognizable icon of Malay culture, specifically from the state of Perak. By designating it as a national industrial heritage, this invaluable tangible repository of traditional technology, artistic expression, and socio-economic history ensures that this unique industry continues for future generations (Jabatan Warisan Negara, 2009).



Figure 4: View with stopper hanging on the side. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO



Figure 5: View fom top with stopper in place. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO



Figure 6: View from top with stopper on the side. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO



Figure 7: Close up view of base of gourd-shaped pot. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO



Figure 8: Bottom view of foot ring of gourd-shaped pot. Photograph by Take Bane Lim (2026). CC-BY-SA 3.0 IGO

References:

Ahmad, N., Salleh, M. F. M., & Harun, S. N. (2019). The Firing Technique of Labu Sayong: Effects of Rice Husk on Vitrification and Water Cooling Properties. Journal of Material Culture and Heritage, 12(3), 45-59.

Ismail, M. H., Saidin, S., & Muhammad, N. H. (2018). The Sustainability of Labu Sayong: A Study on the Craftsmanship and Its Survival in Modern Times. Journal of Heritage Studies, 5(2), 45-60.

Jabatan Warisan Negara (2009). Labu Sayong: Warisan Industri Negeri Perak. Kuala Lumpur: Department of National Heritage.

Mohamed, B., Abdul Rahman, N., & Harun, S. N. (2022). Cottage Industries and Community Identity: The Case of Labu Sayong in Sayong, Perak. International Journal of Regional Culture and Tourism, 11(1), 112-125.

Yuhazmi, M. Y., Kamarudin, Z., & Abdullah, S. S. (2017). The Form and Function of Labu Sayong in Malay Cultural Heritage. Journal of Visual Art and Design, 9(1), 23-35.



Myanmar

Historical Overview Myanmar's Industrialisation

Myanmar has a rich history, the first records of which include the Pyu city-states (200 BCE–849 CE), which were influenced by Indian trade and Buddhism. From the 9th century, the kingdom of Pagan (now known as Bagan) was established in the Irrawaddy Valley, but it was disrupted by Mongol invasions in the 13th Century. The establishment of the Toungoo dynasty (1510–1752) ended an era of political chaos, establishing one of South-East Asia's largest empires. It was succeeded by the Konbaung dynasty (1752–1885), which expanded its borders and laid the foundations of the modern Burmese State. This in turn created tensions with British colonialists in the region.

British colonial rule was established gradually through a series of annexations brought about by the Anglo-Burmese Wars (1824 and 1852). The third of these conflicts in 1885 resulted in the occupation of all of Burma and its absorption into British India. This involved the abolition of the Burmese monarchy, the ensuing new administration introducing cash crops such as rice and the extraction of minerals and forest resources, notably teak.

During World War II, the Japanese invasion in 1942 resulted in Burma becoming a major conflict zone, with the Burma National Army assisting Western allied forces to defeat the Japanese three years later in 1945. Not long afterwards, Burma won its independence from Britain on January 4, 1948. However, subsequent political division led to decades of internal conflict. As a consequence, military rule prevailed between 1962 and 2011, which was briefly followed by a period of liberalisation, but resumed once more in 2021.

Burma was officially renamed Myanmar by the government of the time in 1989. At the same time, its capital, Rangoon was renamed Yangon. In November 2005, the government established Naypyitaw as its new capital.

National Industrial Narrative

The industrial history of Myanmar is dramatic, moving from a pre-colonial agrarian society with localised traditional industries to a colonial-era extractive economy based on cash crops such as rice and forest products, and the mining of minerals and precious stones. This evolved after independence in 1948 with nationalisation and subsequent market-oriented reforms.

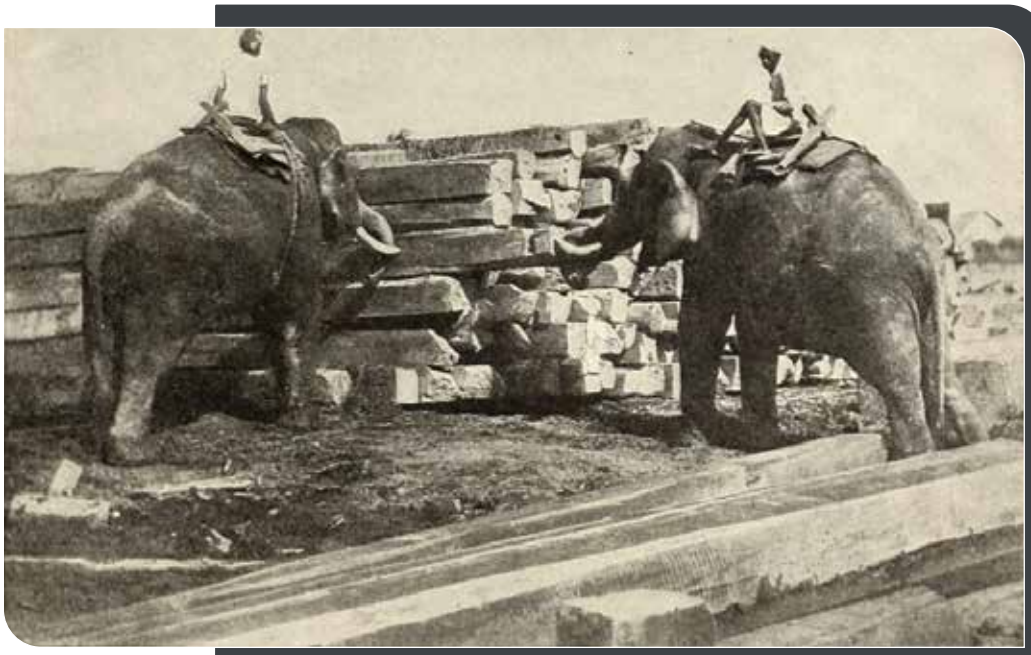


Figure 1: Use of elephants in Burma's teak industry in 1873. Source: Dodge, Mary Mapes, 1830-1905, Wikimedia Commons. CC-BY-SA 3.0 IGO

Burma is especially well-known for its forest industries, and for its teak in particular, which was seen to be hugely valuable across the British Empire. Teak is a tropical hardwood endemic to South and South-East Asia. In addition to the management and harvesting of the trees, the industry involved transporting the logs down rivers and streams, often with the help of elephants, and then processing the wood itself (Figure 1). This frequently required substantial sawmills, especially in cities like Mandalay which, at its peak, is said to have had 12 major sawmilling operations The most successful company in the teak trade was the Bombay–Burma Trading Corporation (BBTC). Its Burma headquarters once occupied a building that survives on Strand Road in Yangon. It was built during the 1920s and is now occupied by Myanmar Airways International.

Teak production grew massively between 1859 and 1900, and more than doubled again in the first two decades of the 20th Century. Most of the teak extracted in Burma was exported to India, but was also sent to Europe where it was put to a wide variety of uses, an example being over three miles of handrail on the Forth Bridge in Scotland, which was opened in 1890 and is now a UNESCO World Heritage site. By 1940 and the start of World War II, Burma was estimated to be producing 85 per cent of world teak exports, but this came at an environmental cost. The unsustainable over-exploitation of teak remains a significant challenge for Myanmar and across South-East Asia.



Figure 2: Location and Image of a Historic Saw Mill near Thingaza Monastery in Mandalay (Four Heritage Walks in Mandalay and Amarapura, MBUR/ Mandalay Building Urban Resilience Project of ADB and MCDC, April 2020)

Meanwhile, petroleum, which was established in the Yenangyaung region by the mid-19th century, became a major industry. The Rangoon Oil Company was established in 1871, trading oil from traditional hand-dug wells in Yenanchoung

This was followed by the establishment of the Burma Oil Company in 1886, a year after the British annexed upper Burma. The company, which was originally incorporated in Glasgow, Scotland, secured exclusive prospecting licences and in effect gained a monopoly on oil exploration and extraction in the region. It introduced modern mechanical drilling equipment and struck oil on a commercial scale in 1889 which resulted in a transition away from earth oil wells in the following decades.
Burma Oil went on to play a key role in the Middle East oil industry, particularly in what was then Persia, and was instrumental in the creation of the Anglo-Persian Oil Company (APOC) in 1909, in which it held a majority stake. This later evolved into the Anglo-Iranian Oil Company, and eventually, British Petroleum (BP). However, the original Burmese operations were nationalised by the Burmese government in 1963.

In addition to petroleum, there were other important extractive industries in Burma. These included gemstones such as rubies and sapphires, which had been well known for centuries. Furhermore, there was significant mining activity, including tin, tungsten, lead and silver, an important example being the Bawdwin Mine at Namtu

During British colonial rule, Burma became one of the world's biggest exporters of rice, with significant parts of the Irrawaddy Delta being transformed into paddies. As a result, one of the largest industries to develop was food processing, and rice milling in particular. Rice production also required the introduction of imported Indian labour, which caused significant tension with indigenous communities.



Figure 3: Illustration of earth oil wells in Yenangyaung, Myanmar (1910). Source: New York Public Library -NYPL_ Hades-2359603-4044367, CC-BY-SA 3.0 IGO

A major industrial inheritance from the British colonial era has been railways, with significant infrastructure like the Gokteik Viaduct termini like Yangon Central Station, and several railway engineering works and goods stations.

The British also established steamboat services such as the Irrawaddy Flotilla Company (Figure 8), whose former offices can also still be seen in Yangon. Like the railways, the steamboats were essential for the transport of workers together with goods to be processed and exported.

A variety of other industries developed in Burma in the British colonial era, such as commercial-scale printing. An example is the former Government Press Buildings whose premises can still be found in Yangon (Figure 9). They were designed by Scottish architect John Begg and completed in 1912.

The establishment of a socialist state after independence in 1948 involved nationalising all industry, although agriculture was exempted. Central planning and state-owned enterprises induced only slow industrial growth, despite major construction projects like the Balu Chaung No. 2 (Lawpita Hydropower Station).

Burma's economy grew slowly by global standards, resulting in the United Nations classifying it as one of the least developed countries in the world by 1987. Since then, successive governments have relaxed restrictions on foreign investment and private-sector activity. This has resulted in a growth in clothing manufacture, alongside a continued dependence on petroleum and natural gas, gemstones and agricultural products. In recent years, the political crisis in 2021 has created further challenges, and most recently, natural disasters such as cyclones and the earthquake of 2025 have also had a severe impact on the country, its peoples and its built heritage.



Figure 4: Bawdwin Mine at Namtu, Burma, 1914-39. Source: Burma Mines Ltd, Wikimedia Commons. CC-BY-SA 3.0 IGO



Figure 5: Bawdwin Mine at Namtu, Tin, lead, silver Shan State of Myanmar, dated 1914-39. Source: RFA, Wikimedia Commons. CC-BY-SA 3.0 IGO

National Inventory of Built Heritage

The Department of Archaeology and National Museum, which operates under the Ministry of Religious Affairs and Culture, collects data on the country's historic sites. However, there does not appear to be a centralised national inventory that is publicly accessible. The existing inventory is primarily intended for overall historic sites, structures and heritage buildings, such as monuments, and there is no systematic inventory only for industrial heritage. Further research is therefore needed to determine the extent to which industrial heritage is documented or recognised. At present, there is no online inventory, and it is unclear whether industrial heritage is explicitly included within national heritage records under the name of industrial heritage.



Figure 6: The Gokteik Viaduct, which was built by the Pennsylvania Steel Company in 1899-1900. Photograph by Bananaplug (2015). Source: Wikimedia Commons. CC-BY-SA 3.0 IGO



Figure 7: Yangon Railway Station. Photograph by ReflectedSerendipity (2013). Source: Wikimedia Commons. CC-BY-SA 3.0 IGO

National and/or System of Statutory National Protection

Myanmar has a national system of statutory protection for ancient sites and built heritage, primarily through the Protection and Preservation of Cultural Heritage Regions Law (2019) and the Ancient Monuments Law (2015). These laws are administered by the Ministry of Religious Affairs and Culture.



Figure 8: Former Irrawaddy Flotilla Company Building, Yangon. Photograph by Phyo WP (2020). Source: Wikimedia Commons. CC-BY-SA 3.0 IGO



Figure 9: The former Government Press Buildings in Yangon. Photograph by Phyo WP (2020). Source: Wikimedia Commons. CC-BY-SA 3.0 IGO

Myanmar has also ratified international conventions related to cultural heritage protection and is home to two World Heritage sites. However, although these laws provide protection for cultural heritage sites, there is no specific legislation intentionally dedicated to the protection of industrial heritage. Amendments and expanded frameworks are therefore needed, with the close collaboration with urban and heritage practitioners. Despite this gap in national legislation, urban preservation initiatives in cities such as Yangon have begun to include industrial heritage, including historic teak-built buildings, colonial buildings in downtown Yangon like Myanma Port Authority, Inland Water Transport and Government Press Buildings, etc.

A good example is the Yangon City Heritage List, which dates from 2001 and is an inventory of cultural landmarks in Yangon, Myanmar, as designated by the city government, the Yangon City Development Committee. The list consists of 188 structures and is largely made up of religious structures and British colonial-era buildings, a significant number of which are constructed from teak. It is arranged geographically



Figure 10: Balu Chaung No. 2 (Lawpita Hydropower Station), built 1954-60 as part of a post-war compensation agreement with Japan. Photograph by Eiquay. Source: Wikimedia Commons. CC-BY-SA 3.0 IGO

by the township in which the structures are located. In 2010, the Ministry of Culture further announced that 16 ancient pagodas in Yangon Division were to be recognised as cultural heritage sites. Of these, the Shwedagon Pagoda is recognised both as an Ancient Monument Zone and a Protected and Preserved Zone. The other 15 are listed as Ancient Monument Zones.

Plate Factory (Baganset)



Figure 1. Baganset U Thaw and his plate featuring portrait of Maha Thiha Thura who is his ancestor. Source: Myanmar Historical Archive, 1970.

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Yangon Region, Mayangon Township

Industrial Designation
The factory and the person who developed the ceramic industry is not recognised under any international conventions

Industrial classification
Mineral Products

Baganset U Thaw is a plate factory named after its owner, the Burmese businessman, trader, administrator and politician named U Thaw. The owner holds a unique place in Myanmar's industrial heritage as a pioneering entrepreneur who established the country's first modern pottery and porcelain manufacturing business. His visionary work in the early 20th century marked a significant step in Burma's industrialisation, particularly in local manufacturing and craftsmanship. Because of his leadership in the industry, the Burmese term Baganset, meaning 'plate factory', was eventually prefixed to his name, making him widely known as Baganset U Thaw. This nickname became a symbol of innovation and industrial entrepreneurship.

Brief description
In 1921, U Thaw began what would become the foundation of Burma's porcelain industry. At a time when most ceramics and household wares were imported, he launched the country's first pottery business with the goal of producing high-quality porcelain locally. By 1925, he had expanded his operations and built a full-scale porcelain factory near Insein Khawe Farm, which is now located close to the Thamine Myo Thit Railway Station in Mayangon Township, Yangon. The factory specialised in producing everyday ceramic goods such as plates, cups, and flower pots—items essential to Burmese households and increasingly in demand across the region. His factory's products gained a strong reputation for quality and durability, leading to growing popularity not only in Burma but also in other Asian countries, particularly China, by the late 1930s.

However, his success faced a tragic setback during the 1949 Battle of Insein, one of the fiercest conflicts of the Karen insurgency. U Thaw's factory was caught in the crossfire and was ultimately destroyed by Burmese naval Bofors, artillery, and bombing. The destruction marked a significant personal and national loss and was an early example of how political instability could devastate industrial progress. U Thaw later recounted his experience of financial and emotional ruin in an article published in The Rotarian magazine in 1951.
Despite this loss, Baganset U Thaw's contribution to Burma's industrial heritage remains deeply respected. His name is often mentioned in Burmese biography books and lists of pioneering entrepreneurs. More than just a businessman, he embodied the spirit of local innovation and resilience. His legacy lives on as a symbol of early industrial entrepreneurship in Myanmar, reminding future generations of the importance of vision, craftsmanship, and the pursuit of self-sufficiency.

His factory's products gained a strong reputation for quality and durability, leading to growing popularity not only in Burma but also in other Asian countries, particularly China, by the late 1930s.

Period(s) of operation
1925 - 1949

Key events/chronology and changes to relevant attributes
1925, expansion of operations and building of a full-scale porcelain factory near Insein Khawe Farm

The factory's products gained a strong reputation for quality and durability not only in Burma but also in other Asian countries by the late 1930s

Factory destroyed during the 1949 Battle of Insein

Current status and state of conservation
The factory was destroyed, so no in-situ physical remains survive. There is therefore no protection or conservation regime. All that therefore survives are the products of the factory, miscellaneous records, and memories in communities across Myanmar.

Burmah Oil Company

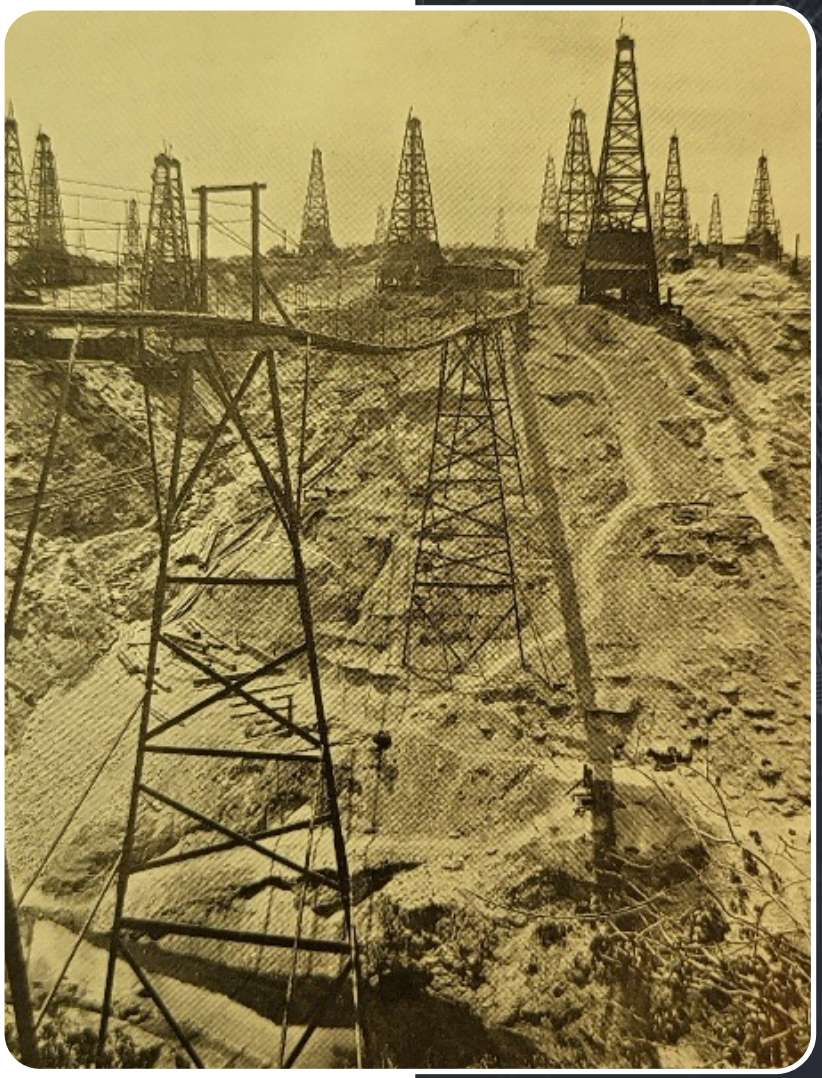


Figure 1: Yenangyaung Oil Springs. Source: Arnold Wright, Twentieth Century Impressions of Burma, 1910. Public Domainn

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Magway Region, Yangon

International Designation
The site has not yet been formally inscribed under any international convention.

Industrial classification
Energy

Description of the site
The Burma Oil Company (BOC), established in 1886, stands as a significant chapter in the industrial heritage of both Britain and Burma. Originating during the British colonial era, the company played a crucial role in the early development of the global petroleum industry and was instrumental in shaping the oil sector in South-East Asia. Its legacy is deeply tied to industrialisation, colonial economics, and the technological advancement of oil exploration and refining.

Initially formed to exploit oil fields in the British-controlled territory of Burma (now Myanmar), BOC quickly became a pioneer in the extraction, refining, and transportation of crude oil. The Yenangyaung and Chauk oil fields became central to its operations, using early steam-driven drilling rigs and rudimentary refining techniques. Together with other refineries in Dunneedaw on the Rangoon River, and at Syriam and at the Bogyoke on the Pegu River the company covered 1,300 acres of land. They also had a network of depots and storehouses in India with large storage tanks in Calcutta, Bombay, Madras, Karachi, Chittagong, Marmagao, Coconada, Tuticorin and Cochin. These activities marked some of the earliest modern petroleum operations in Asia, and they significantly influenced the global understanding of hydrocarbon resources.

Brief description
BOC's strategic importance became even more apparent in the early 20th century. As demand for petroleum products grew, particularly during the two World Wars, the company became a critical supplier for the British military. It developed infrastructure such as pipelines, rail transport systems, and refineries that not only supported war efforts but also laid the groundwork for Burma's industrial landscape.

As part of its industrial heritage, BOC also contributed to technological innovations and labour systems. It imported British engineers and trained local workers, introducing industrial practices that would shape the country's technical workforce. These activities, however, were deeply interwoven with colonial dynamics, raising important questions about labour exploitation and resource control by foreign powers.

Following Burmese independence in 1948, and amid growing nationalist sentiment, BOC's presence became increasingly controversial. In the 1963, the company was nationalised as part of a broader socialist policy under General Ne Win, ending British corporate control and integrating the oil industry into state-led development plans. Though BOC ceased to exist as a private entity in Myanmar, its legacy remains embedded in the infrastructure, workforce, and institutional memory of Myanmar's oil sector.

Today, the remnants of BOC's operations, such old refineries, drilling equipment, and colonial-era buildings are important markers of Myanmar's industrial heritage. They offer insight into the early globalisation of the oil industry and serve as a reminder of the complex interplay between technology, empire, and resource extraction that shaped the modern industrial world.

Period(s) of operation
Established in 1886, nationalised in 1963

BOC invested in exploration in Iran and consequently owned 23 per cent of The British Petroleum (BP) Company until the mid 1970s.

In 1963 the company left Burma and undertook new exploration in India, Pakistan, Bangladesh, Australasia, the Americas, Canada and the North Sea.

Current status and state of conservation
While there are surviving remnants from the activities of the BOC, there is not a coherent site, and therefore there are no conservation, protection or threat issues.

Sat San Warehouse

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Yangon Region

International Designation
The site has not yet been formally inscribed under any international convention.

Industrial classification
Transport

The Sat San Warehouse is located near Yangon Central Railway Station and is an important component of Myanmar's industrial heritage. Constructed during the British colonial era, it formed part of the extensive railway and storage infrastructure that enabled Yangon to develop as a leading commercial and transport hub in South-East Asia. Closely linked with the railway network, the warehouse reflects the integration of transport, storage, and trade that defined the industrial character of what was colonial Rangoon.

Brief description
Strategically positioned near the railways, Sat San Warehouse was designed to store bulk commodities, particularly rice, which was Burma's one of the most important exports during the colonial period. Goods arriving from the fertile Ayeyarwady Delta were transported by rail or river to Yangon, where warehouses like Sat San provided secure storage before shipment through the port. This system of interconnected warehouses, jetties, and railways was critical to Yangon's function as the 'rice bowl of Asia'. The Sat San Warehouse, therefore, stands as a symbol of the city's role in the global trade network.

The warehouse also carries social and cultural meaning. It was not only a storage facility but also a place where hundreds of workers laboured daily, loading, unloading, and maintaining the steady flow of trade goods. The Sat San area became a lively hub of economic activity, surrounded by markets, small businesses, and residential neighbourhoods shaped by the rhythms of industrial work. For many local families, employment connected to the warehouses and station provided livelihoods across generations.

Today, while the role of Sat San Warehouse has diminished due to modernisation and changes in trade logistics, its heritage value remains significant. It represents the layered history of Yangon's railway-based industrial system and the city's rise as a global trading port. Preserving and documenting the Sat San Warehouse under Myanmar Station is crucial for understanding the intersection of transport, economy, and community in Myanmar's industrial development.

Period(s) of operation
Constructed during the British colonial era and being used till now.

Current status and state of conservation
No known conservation programme, but there is surviving documentation which includes photographs. No known threats, and the site does not have any form of statutory protection.

Yangon Central Railway Station



Figure 1: Yangon Central Railway Station. Photograph by Don Christie (1963). Source: WikiCommons. CC BY-SA 4.0

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Yangon Region

International Designation
The site has not yet been formally inscribed under any international convention.

Industrial classification
Infrastructure
Transport

Brief description
Originally built by the British in 1877, the station was designed in the Victorian architectural style, reflecting the colonial influence on infrastructure during that period. It played a crucial role in British Burma's efforts to integrate and control the country through transportation networks. The railway facilitated the movement of goods such as rice, timber, oil, and minerals, and also enabled more effective administration and troop movements across the colony.

However, the original structure was destroyed during World War II by retreating Allied forces in 1943 to prevent its use by the advancing Japanese army. After the war, a new station was built in 1954, this time in a distinctly Myanmar architectural style, designed by Burmese architect U Tin. The design features traditional tiered roofs known as pyatthat, a symbol of Burmese royalty, integrating national identity into a modern, functional building.

The Post-war Yangon Central Railway Station not only revived a critical piece of infrastructure but also became a symbol of national pride and resilience. It represents a unique fusion of industrial functionality with cultural expression, making it stand out among Southeast Asian railway stations.

Today, Yangon Central Railway Station continues to function as a major transit point for long-distance and suburban trains, including the Yangon Circular Railway, which serves thousands of daily commuters. Although much of the infrastructure has become outdated, the station remains a bustling hub of economic and social activity.

As urban development accelerates in Yangon, there are growing discussions about modernising the station while preserving its architectural and historical character. The station is included in several heritage preservation proposals and is considered a landmark worth protecting. In essence, Yangon Central Railway Station stands as a testament to Myanmar's industrial development, colonial past, post-independence aspirations, and cultural identity. Its preservation is not only about saving a building, it is also about safeguarding a living piece of Myanmar's history.

Period(s) of operation
Original station built in 1877, but destroyed in 1943.
Current station built in 1954 and is still operational.

State of conservation
Owned by the Ministry of Transport, the site is largely intact, but is in need of structural repair and restoration in some areas, the main threat being a lack of regular maintenance. It is included in 'the Yangon City Heritage List'. There are records of the building, including photographs

The Botahtaung Jetty



Figure 1: Botahtaung Jetty. Photograph by Sidcao (2009). Source: WikiCommons. CC BY-SA 4.0

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Yangon Region

International Designation
The site has not yet been formally recognised under any international convention.

Industrial Classification
Infrastructure
Transport

Brief description
Botahtaung Jetty, located along the Yangon River near the historic Botahtaung Pagoda, is an important part of Myanmar's maritime and industrial heritage. As one of the central jetties in downtown Yangon, it has played a significant role in the city's economic, cultural, and social life for more than a century. The jetty reflects both the colonial legacy of Yangon as a port city and its continuing importance as a hub for trade, transport, and communication.

The physical structure of the jetty, built of timber, concrete, and steel, reflects the industrial engineering practices of its time. Its design emphasised practicality, durability, and the ability to handle large volumes of goods and passengers. The warehouses and customs offices associated with the jetty further highlight its role as a logistical hub. Though utilitarian in appearance, the jetty was embedded in a larger urban-industrial landscape that included port warehouses, railway lines, and road networks linking the waterfront to Yangon's commercial core.

Beyond its technical and economic functions, Botahtaung Jetty also held strong social and cultural significance. For generations of Yangon residents, it served as a gateway to the city. Migrants, traders, and travellers arriving from the delta and coastal towns would often first set foot in Yangon at this point. The jetty was also central to daily life, as ferries transported workers, students, and families across the river. Its bustling environment of dockworkers, traders, and passengers created a lively social space, making the jetty not just a transport facility but a site of human interaction and exchange.

Today, while modernisation and port expansion have shifted much of Yangon's maritime trade to larger facilities, Botahtaung Jetty remains a heritage landmark. Preserving its legacy contributes to understanding Myanmar's industrial history, the city's urban evolution, and the continuing cultural significance of its riverfront.

Period(s) of operation
Historically, Yangon was developed into a major port under British colonial administration in the nineteenth and early twentieth centuries. The construction of jetties such as Botahtaung was central to this transformation and it is being used till now.

Strategically located on the eastern edge of the city, Botahtaung Jetty provided docking facilities for ferries, cargo vessels, and river steamers that transported goods and people between Yangon and towns along the Ayeyarwady Delta. Rice, teak, oil, and other export commodities passed through the jetty, making it part of the larger industrial system that sustained colonial Burma's economy.

State of conservation
The site is largely intact, retain significant original materials although it is in need of repair and restoration. There is therefore a long-term threat if a maintenance programme is not provided. Currently, it does not have statutory protection and is not mentioned in an any heritage inventories. Documentation includes historic photographs.

Ownership
Myanmar Ministry of Transport

The Namtu-Bawdwin Mines



Figure 1: Bawdwin Mine at Namtu between 1914 and 1939. Source: RFA. Public domain.

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

International Designations
The site has not yet been formally recognised under any international convention.

State, Province, Region
Myanmar, Shan State

Industrial classification
Extraction

Brief description

The Namtu-Bawdwin Mines, located in northern Shan State, represent one of the most remarkable chapters in Myanmar's industrial heritage. Known globally before World War II as the largest source of lead and among the largest producers of silver, the mines not only contributed significantly to the country's economy but also reflect a long and complex history of international trade, colonial exploitation, indigenous governance, and industrial innovation.

Under British control, the mines were modernised with railways, smelters, hydroelectric power, and deep tunnelling. This industrial transformation turned the Namtu-Bawdwin complex into a centrepiece of the colonial mining economy. Namtu is also the headquarters of the Burma Mines Railways. The infrastructure was extensive: mineral railways connected the mines to smelting facilities, while the town of Namtu itself developed into a bustling industrial hub with worker housing, workshops, and processing plants. Tunnels like the Tiger Tunnel, completed in 1916, were engineering marvels that enabled deeper and more efficient extraction. By the 1920s and 1930s, the mine was exporting thousands of tons of lead and silver annually, cementing its status on the global stage.

However, during World War II, the mines were damaged and later fell into decline. After independence, the industry was nationalised under socialist policies in the 1960s. Today, the mines are managed by Myanmar's Ministry of Natural Resources and Environmental Conservation, with some renewed interest in redevelopment. The Namtu-Bawdwin Mines stand as a monument to Myanmar's early industrial capacity. They reflect a blend of indigenous governance, foreign investment, and technical innovation. Their tunnels, mineral railways, and smelting ruins are not only remnants of a bygone era but also are important markers of industrial heritage and a legacy of labour, technology, and transformation in South-East Asia.

Period(s) of operation

The Namtu-Bawdwin Mines were first opened by the Chinese in the 15th century. In modern times, the first prospecting licence was issued to a private company, Skaries Brothers of Rangoon. In 1903 it was transferred to Great Eastern Mining Company Limited. Great Eastern Mining Company was bought out by Burma Railway and Smelting Co, Ltd. in 1906. It was transferred to Burma Mines Company Limited in 1909, one of whose innovations was the construction of a smelting furnace to process slag in Mandalay. Burma Mines Co Ltd started exploration in the Chinese



Figure 2: Railway tracks at Bawdwin Mine. Source: RFA. Public domain.

old workings and a vertical shaft was commenced. Smelting of the ores began at Namtu in 1912. The main ore body, 'Chinaman Lode', was discovered in 1913. The Burma Mines Co Ltd was then taken over by The Burma Corporation, which was producing 500,000 tons of ore per year by 1942. During the Japanese occupation (1942-45), an estimated 200,000 tons of high-grade ore were extracted from the mine. After the Second World War, Burma Corporation recommenced business and continued production of lead, Zinc and Sliver between 1945 and 1951 when the Burmese Government created a joint-venture with Burma Corporation. The Bawdwin mine was subsequently nationalised in 1965 and the name of company has changed to the Peoples' Bawdwin Industry, Bawdwin Corporation in 1970, and No. 1 Mining Enterprise of the Ministry of Mines by 1976. The mine remains open today, and by 2019 was operated by Australian-listed 'Myanmar Metals'.

Research and documentation
Documentation includes international research records, and photographic materials. Published references exist in the areas of Mining and Geology, and business studies.

Current status and state of conservation
The site is largely intact and original components survive, although some are in need of structural repair and restoration, with lack of maintenance being a significant threat. The site does not feature in any heritage inventory and has no statutory protection at regional or national level.

Ownership
Myanmar Metals

The Gokteik Viaduct, Northern Shan State



Figure 1: Gokteik viaduct, Shan State, not long after its opening in 1900. Source: Rowe & Co, *Typical photographs of Burma: Burmese life and scenes*, Rangoon: Rowe & Co. 1900. Public domain.

Contributors:
Heritage scholars from Myanmar who prefer to be anonymous

State, Province, Region
Myanmar, Northern Shan State

International Designation
The site has not yet been formally recognised under any international convention.

Industrial classification
Engineering
Transport

Brief description
The viaduct measures 689 metres (2,260 ft) from end to end, and includes 15 towers (or trestles) which each span 12 metres (39 ft), along with a double tower 24 metres (79 ft) long. The 15 towers support ten deck truss spans of 37 metres (121 ft) along with six plate-girder spans of 18 metres (59 ft), and an approach span of 12 metres (39 ft). Many sources have put the height of the bridge at 250 metres (820 ft). That is supposedly a measurement to the river level as it flows underground through a tunnel at the point where it passes underneath the trestle. The true height of the bridge, as measured from the rail deck to the ground on the downstream side of the tallest tower, is 102 metres (335 ft). The cost of construction in 1900 was UK £111,200.

The Gokteik Viaduct, located near Naung Cho in northern Shan State, has long stood as one of Myanmar's most iconic feats of engineering and a symbol of the country's industrial heritage. Completed in 1900, the viaduct was part of the Mandalay–Hsipaw–Lashio railway, constructed by the British to expand their influence into the Shan Hills and facilitate trade and military logistics toward the Chinese border.

Designed by English engineers Alexander Rendel & Sons, the construction contract was awarded to the Pennsylvania Steel Company of the United States. At the time of its completion, the viaduct was the longest railway trestle in the world, spanning 2,260 feet (690 meters) and towering 320 feet (98 meters) above the Gokteik Gorge. The structure was considered an engineering marvel, especially given the steep terrain, with the railway line rising continuously at a 1:40 gradient. Prefabricated steel components were imported from the USA and assembled on-site under challenging conditions, highlighting both the global reach and technological ambition of industrial projects during the colonial era.

The Gokteik Viaduct played a crucial role in connecting remote highland regions to central Burma, enabling the transport of minerals, timber and other goods, and integrating Shan State into the colonial economy. For over a century, it functioned not only as a vital transport route but also as a cultural and historical landmark, attracting tourists and train enthusiasts from around the world.

Period(s) of operation
1900 until today – still operational.

The British government awarded an American steel company with the contract to construct what would become the world's longest railway trestle bridge at the time of its completion in 1900. As an engineering marvel of its era, the Gokteik Viaduct is widely cited, and is included in Paul Theroux's acclaimed travelogue, 'The Great Railway Bazaar'. He described the viaduct as "a monster of silver geometry in all the ragged rock and jungle, its presence was bizarre".

Research and documentation
Documentation includes international research records and photographs. Published references exist in the areas of Civil Engineering, Historicity and Geopolitics.

Current status and state of conservation and protection
The site is largely intact with its original fabric intact. However, it requires some structural repair and restoration in some areas, and insufficient maintenance may be a threat in the future.

It does not feature in any heritage inventory and currently has no statutory protection.

Ownership
Myanmar Ministry of Transportation



Philippines

Contributors:

Ivan Anthony Henares
Associate Professor
Asian Institute of Tourism,
University of the Philippines,
Diliman, Quezon City

Timothy Augustus Ong
Vice President for Research
Heritage Conservation Society

National Industrial Narrative

The industrial history of the Philippines is a complex interplay of indigenous knowledge systems and practices, colonial legacies, social transformations, and political shifts. Before colonisation, the independent Philippine polities were predominantly agrarian, with local industries centred around textiles, metalwork, boat building, and pottery. Small-scale industries thrived within a barter-based and later a regional trade economy, especially along coastal communities that interacted with Chinese, Malay, and Arab traders (Scott, 1994).

Spanish colonisation marked a shift in economic organisation. The colonial government focused primarily on agriculture, particularly cash crops like sugar, tobacco, and abaca for export. The Manila-Acapulco Galleon Trade connected the colony to global markets but did little to develop domestic manufacturing. Most industrial activity was small-scale and community-based and centred around the processing of agricultural goods. Infrastructure development, such as roads and ports were aimed at maximizing extraction and export than internal industrialisation (Corpuz, 1997).

The American period brought new emphasis on modernisation, technical education, and infrastructure. The colonial government introduced more railways, public works, and public schools, fostering a more literate and technically skilled workforce (Kramer, 2006). The U.S. also liberalized trade through the Payne-Aldrich (1909) and Underwood (1913) Acts, which allowed Philippine exports duty-free entry into the American market, but was highly controlled by the Commonwealth government. Industries such as sugar milling and abaca rope production were mechanized under foreign ownership, while Filipino entrepreneurs remained largely marginalised due to capital and policy constraints (Legarda, 1999).

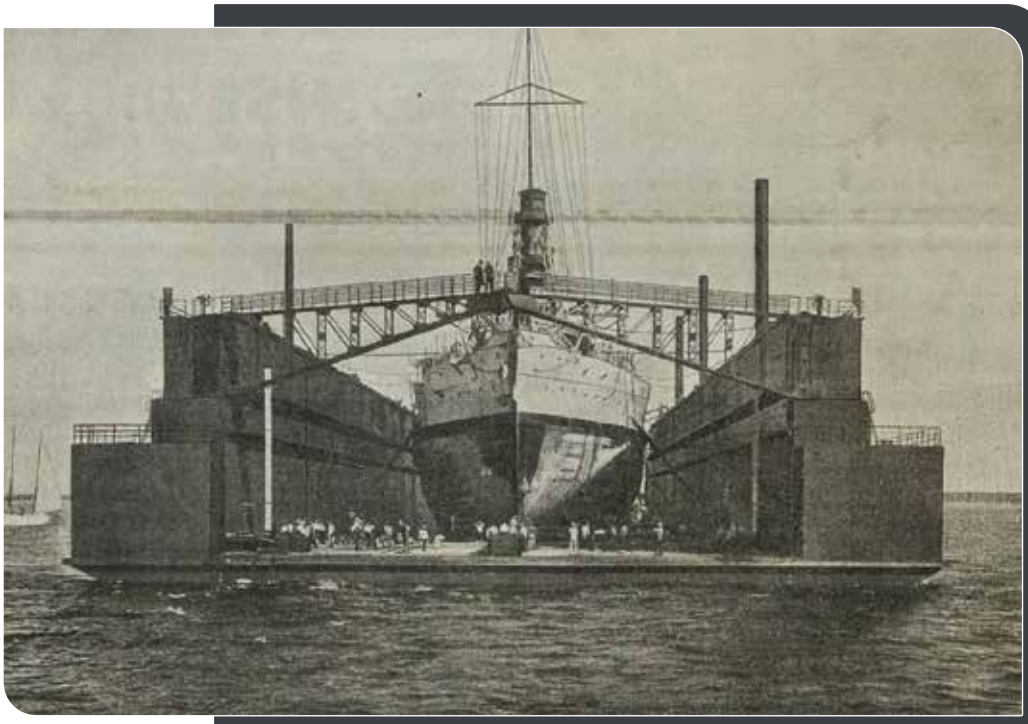


Figure 1: Cavite Floating Docks Le Genie Civil (March 1906)

World War II devastated Philippine infrastructure and industry. Factories were destroyed, trade collapsed, and the economy was reduced to subsistence levels. After independence in 1946, the Philippines adopted import substitution industrialisation, using protectionist policies to promote domestic manufacturing and reduce reliance on imported goods, particularly during the 1950s and 1960s (ADB, 2007; Canlas, 2015). The government enacted tariffs, quotas, and incentives for local industries, leading to a short-lived industrial boom in the 1950s and 1960s. Key industries included textiles, food processing, cement, and household goods (Habito & Medalla, 2001).

Under Ferdinand E. Marcos, the government initially promoted export-oriented industrialisation and infrastructure expansion. The establishment of industrial estates and the development of the Bataan Export Processing Zone in 1972 marked the beginning of the country's experiment with export processing and foreign investment. However, crony capitalism was also entrenched. Government contracts, loans, and monopolies were awarded to political allies, leading to inefficiency and corruption. External debt soared, and by the early 1980s, the economy faced a severe crisis. The industrial sector stagnated due to political instability, a deteriorating business environment, and declining investor confidence (Claudio, 2017).

After the People Power Revolution in 1986, successive governments pursued structural adjustment policies promoted by the IMF and World Bank. These included trade liberalization, privatization, and deregulation. While these reforms aimed to integrate the Philippines into the global economy, they also exposed local industries to intense foreign competition without adequate support or technological upgrading. This resulted in a stagnation of local manufacturing under successive periods of political instability and structural debt, with policy attention

shifting to labour export and service industries. Overseas Filipino Workers (OFWs) became central to economic strategy, with remittances providing stability amid recurring crises. The rise of business process outsourcing (BPO) and the service sector as a whole had outpaced industry as the primary source of foreign exchange and employment, reshaping both development priorities and national economic policy (ADB 2013).

Industrial Heritage Today

Industrial heritage in the Philippines has suffered major losses due to the absence of legal recognition and protection. Many factories, power plants, and sugar centrals have been demolished, including the Rockwell and Sucat Thermal Power Plants, the Pandacan Oil Depot, Bacolod Murcia Milling Company, and Pampanga Sugar Development Corporation. Recent losses include the Philbanking Building, Barit Bridge, Sunico Foundry, Puente de Putol Grande, and Kraut Art Glass Workshop (Henares, 2022).

Industrial heritage is a new and developing field in the Philippines. It represents the material evidence of labor, technology, and modernisation, providing a tangible link to how industries shaped communities and everyday life (Cossons, 2012).

To safeguard and interpret this legacy, establishing a Philippine Museum of Industrial History is essential (Henares, 2022). The museum would serve as a national center for research, documentation, and education, bridging historical understanding with adaptive reuse practice (Henares, 2022).

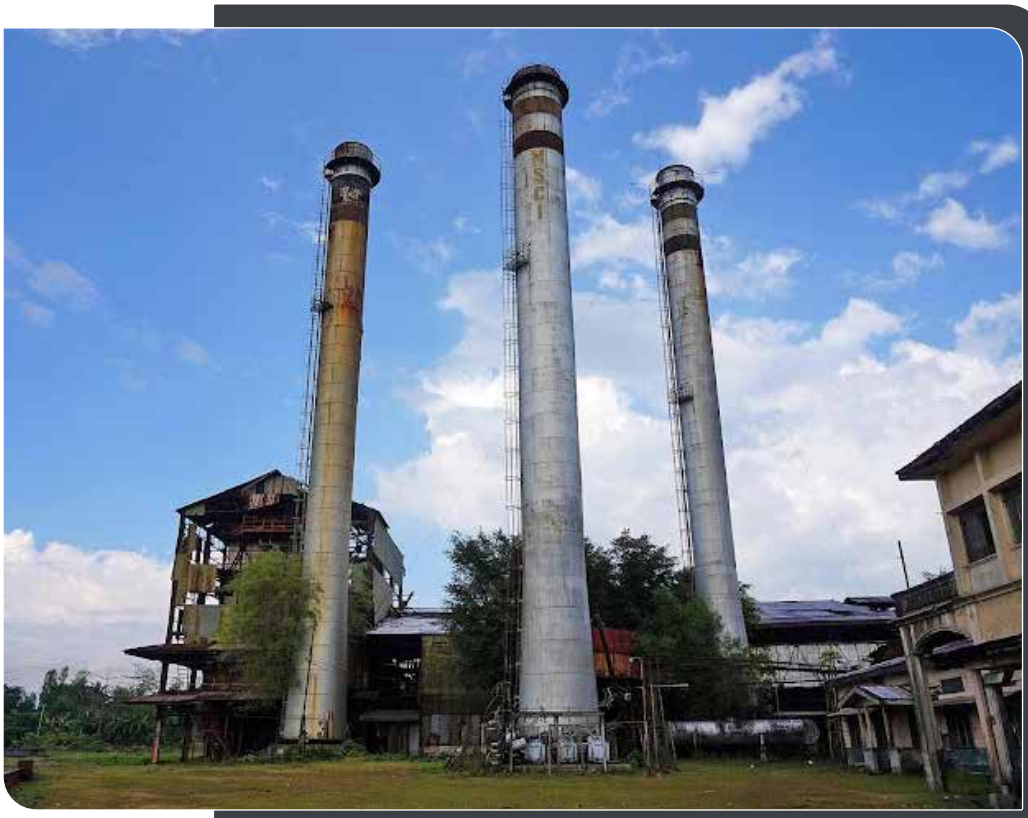


Figure 2: Ma-ao Sugar Central Maao. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Education and capacity-building are equally crucial. Continuous training programs for cultural workers, planners, and local governments should be developed in partnership with heritage institutions and international experts to build knowledge in this emerging field. The integration of industrial sites in the PRECUP registry can complement these efforts by ensuring better visibility, coordination, and preservation planning.

Transnational Connections

The Philippines' industrial history is deeply tied to transnational exchange. As an archipelago at the centre of South-East Asia, it functioned for centuries as a maritime crossroads. By the 10th century, coastal port-polities were trading with Chinese traders exchanging ceramics and textiles for gold, beeswax, and forest products. This early regional trade set the stage for the Manila-Acapulco Galleon Trade (1565–1815), which linked Asia and the Americas through Spanish-controlled shipping. Filipino shipyards in Cavite and other ports supplied the vessels that carried Chinese silks and porcelain to Mexico, returning with silver to finance the colony.



Figure 3: Tutuban Station Prior to Adaptive Re-use. Photograph by John Ward. Source: Flickr. CC-BY-NC-SA 2.0



Figure 4: Tutuban Station Restored. Photograph by Patrick Roque. CC BY-SA 3.0

In the 19th century, agricultural exports tied the Philippines more closely to global markets. Sugar from Negros and Panay flowed to the United Kingdom and Australia through British merchant houses, while abaca became indispensable to the U.S. Navy and global shipping. By the 1920s, the Philippines supplied over 90% of the world's abaca and had become the leading exporter of copra and coconut oil, supported by tariff-free access to American markets.

Mining and forestry, expanded under American rule, further integrated the country into industrial supply chains, supplying copper, gold, and timber to global markets. These industries bound domestic production to foreign capital, markets, and transport systems, shaping economic structures well into the postcolonial period.



Figure 5: Pier 7 Under Construction.
Source: *Bureau of Public Works Golden Book* (1955)

Availability of National Inventory or Database for the Country's Built Heritage

The Philippines maintains its national inventory of built heritage through the Philippine Registry of Heritage (PRH), overseen by the National Commission for Culture and the Arts (NCCA), the country's de facto cultural ministry. PRECUP is a geolocated database that consolidates the inventories of major cultural agencies, including the National Museum of the Philippines (NMP), the National Historical Commission of the Philippines (NHCP), the National Library, and the National Archives. In line with Republic Act No. 11961, it also integrates heritage inventories prepared at the Local Government Unit (LGU) level, ensuring a nationwide, multi-agency record of cultural properties.

The PRH or the Talapamana ng Pilipinas is hosted by the NCCA and may be accessed at https://talapamana.ncca.gov.ph/

Republic Act No. 11961, the Cultural Heritage Preservation and Protection Act of 2024, formally acknowledges industrial heritage through reference to the TICCIH Nizhny Tagil Charter of 2003. Nonetheless, the PRH does not contain a distinct classification for industrial heritage. Existing entries have been correlated with TICCIH's inventory and recognised through designations as Important Cultural Properties, National Cultural Treasures, or by local ordinances. While selected sites are included, there is no definitive overlay or mapping protocol. Institutionalizing industrial history and archaeology at both national and local levels remains essential for comprehensive identification and protection.

The Philippines provides statutory protection for built heritage primarily through Republic Act No. 10066, the National Cultural Heritage Act of 2009. Section 5 establishes a presumption that all structures over 50 years old are Important Cultural Properties (ICPs), unless declared otherwise, thereby requiring clearance from the appropriate cultural agency before any demolition, alteration, or relocation. At the national level, marked properties may be elevated to classifications such as National Cultural Treasures (NCTs), Important Cultural Properties (ICPs) or National Historical Landmarks (NHLs) and the like by the National Museum or the National Historical Commission of the Philippines.

Available System of Statutory Protection for Industrial Heritage Sites

Industrial Heritage sites are recognised and protected on the national level as National Cultural Treasures (NCT), Important Cultural Properties (ICP) or National Historical Landmarks (NHL). While Industrial Heritage as a category per se is not specified in the Philippine Registry of Cultural Properties, several bridges, churches, lighthouses, plantations, sugar mills, and water utilities have been declared as NCT, ICP, or NHL, according to the industrial heritage inventory maintained by TICCIH Philippines.

Republic Act No. 11961, the Cultural Heritage Preservation and Protection Act of 2024, strengthens this framework by mandating comprehensive inventories through PRH and requiring integration of heritage protection into local planning. Local Government Units (LGUs) are empowered to enact ordinances, ensuring statutory safeguards extend to the city and municipal levels, reinforcing heritage protection through both national and local mechanisms.

Sustainability

Philippine industrial heritage contributes to the SDGs through both pivoting heritage industries and conserved sites. Abaca as a renewable fiber is finding use in green packaging, advancing SDG 12 for sustainable production. Among sites, UP Los Baños plays a central role in SDG 2 (Zero Hunger) and SDG 4 (Quality Education) through agricultural innovation. Tutuban Station demonstrates adaptive reuse (SDG 9 and 11), the Davao abaca community as a proposed tourism community links to SDG 8 and 11, and the currently renovating Balara Filters Park to SDG 3, 6 and 15.



Figure 6: Sun Drying of Copra. Source: Fumio Makoshi, Davao Photobook (1930)



Figure 7: Philippines: Coconuts. *Husking Coconuts - Familiar Scene in the Great Coconut Country Near Pagsanhan, Island of Luzon*, P.I.' Stereograph, c. 1910

Selected Industries:

Maritime and Shipbuilding

As an archipelagic nation in South-East Asia, the Philippines has long been a maritime crossroads. It was engaged in regional trade by the 10th century, exchanging gold, beeswax, and forest goods for ceramics and textiles from China, Champa, and Java (Scott, 1994; Junker, 1999). From 1565 to 1815, it became a key link in the Manila-Acapulco Galleon Trade connecting Asia and the Americas (Schurz, 1939).

Shipbuilding sustained this network. The Spanish relied on Filipino labour, maritime skill, and hardwoods to build vessels in Cavite, Santa Ana, and Zamboanga (Corpuz, 1997). Cavite emerged as the principal dockyard with drydocks, warehouses, and workshops for galleons and gunboats. Filipino-built ships were noted for low cost and durability. Materials such as sails, ropes, and timber were procured locally, often through forced requisition, making Philippine shipbuilding cheaper than in Spanish America. This infrastructure enabled the galleon trade, financed colonial revenues, and positioned Manila as a mercantile entrepôt (Valdez-Bubnov, 2021).

Spain also developed ports, defenses, and navigational aids. The 1857 Plan General de Alumbrado Marítimo established over 50 lighthouses and 22 stations across the archipelago (Noche, 2005), improving maritime safety and marking the coastline with enduring faros. After 1898, American modernization of ports and naval bases sustained the Philippines' role in trans-Pacific commerce (Corpuz, 1997).



Figure 8: Sugar mill, Negros Occidental, 1910-1920. Sugar mill, La Carlota, Negros Occidental. Source: United States National Archives : 350-P-AD-3-17

Sugarcane

The Philippine sugar industry has a complex legacy: while it contributed to economic growth and elite wealth, it entrenched inequality, labour exploitation, and regional disparity. Before colonisation, sugarcane (Saccharum officinarum) was grown by indigenous communities for chewing, sweetening, and alcohol fermentation (Sajor, 1986). Under Spanish rule, it became a minor cash crop, but in the 19th century global demand and new trade policies transformed it into a major export. The opening of Manila to foreign trade in 1834 and Iloilo in 1855 integrated the islands into world markets (Sonza, 1985; Aguilar, 1994). Negros Island, with its fertile volcanic soil, became the industry's centre, supported by migrant labour and feudal estates.

Frenchman Yves Leopold Germain Gaston pioneered modern milling in Silay, introducing the horno economico iron mill in the 1850s. British vice-consul Nicholas Loney, often called the 'Father of the Philippine Sugar Industry', imported steam-powered mills and promoted Iloilo as a sugar port, financing planters but embedding debt relations (Aguilar, 2017; McCoy, 1993). Their efforts spurred migration from Panay to Negros and rapid expansion of haciendas.

By the late Spanish and American periods, industrial sugar centrals emerged, capital-intensive mills processing cane from multiple plantations. Backed by American capital and preferential tariffs, sugar became the country's top export by the 1920s. However, sacadas (seasonal labourers) remained underpaid and marginalized.

Postwar, U.S. quotas sustained the industry until the 1970s, when Marcos centralized control through Philsucom and NASUTRA. Inefficiency and corruption led to the 1980s sugar crisis, which devastated livelihoods in Negros and triggered widespread unrest. Sugar's growth tied the Philippines to global markets, but its benefits accrued unevenly. The feudal landholding and exploitative labor structures established in the 19th century continue to shape Philippine society and politics today (Tadem, 2005).

Abaca

Abaca (Musa textilis), or Manila hemp, was central to the Philippine economy and global maritime history. Valued for its strength and saltwater resistance, it was indispensable for ropes, rigging, and specialty papers, making the Philippines the world's primary source through the Spanish and American eras.

Before colonisation, upland groups like the Bagobo and Manobo manually processed abaca for local use (Bankoff, 2004). Under Spain, it became a commercial crop, gaining prominence in the 18th and 19th centuries as global demand for ship cordage rose. Following Manila's opening to world trade, abaca emerged as a top export with British and American investment (Corpuz, 1997).

During the American period, abaca reached its peak, supplying over 90% of global demand by the 1920s (Owen, 1971). The fiber became vital to the U.S. Navy and shipping, spurring plantation expansion in Mindanao and Bicol. Many estates, often American or Japanese-owned, displaced indigenous communities and converted ancestral lands (McCoy, 1982). The 1930s advent of synthetic Nylon diminished abaca's strategic role, yet it remains an important export commodity, with the Philippines still providing roughly half of the world's supply.



Figure 9: Falling a giant stalk for its fibre. Source: Fumio Makoshi, Davao Photobook (1930)



Figure 10: Women making cigars, Manila, 1920-1930. Source: United States National Archives : 350-P-AE-4-13

Tobacco

Tobacco likely reached the Philippines via the Manila-Acapulco Galleon Trade, which connected Asia and the Americas (Merrill, 1903). Initially grown on a small scale, cultivation expanded rapidly with rising local and international demand. Northern Luzon, especially the Cagayan Valley, became the centre of production due to its favorable climate and soils (Corpuz, 1997).

As profitability grew, the Spanish colonial government imposed the Tobacco Monopoly (Estanco) in 1872. This system required farmers to sell exclusively to the state at fixed prices, maximizing colonial revenues but creating hardship and widespread resentment (Kahle, 2016). Enforcement was strongest in the Cagayan Valley, where production was concentrated, making the region a site of both economic integration and social tension (Corpuz, 1997).

The monopoly reflected broader patterns of colonial resource control. Popular discontent surfaced in revolts such as the 1872 Basi Revolt—primarily tied to sugar wine but emblematic of unrest against monopolies (Aguilar, 2010). Tobacco thus became both an economic engine and a flashpoint of colonial resistance.

Mining

Mining has been significant in the Philippines since pre-colonial times, when indigenous peoples extracted gold and other metals for trade and ornamentation. Under Spanish rule, mining became integrated into the colonial economy, with gold extraction centred in Benguet, the Cordillera Mountains, Mindoro, and Palawan. The encomienda system supplied labor, often through coercion, and conditions were harsh, though some indigenous techniques persisted (Schreurs, 1985; Tiongson, 2013).

American rule in 1898 introduced new laws and foreign investment. The Mining Act of 1905 established the Bureau of Mines, encouraged private concessions, and streamlined property rights, attracting American and other foreign capital. Mechanized equipment, roads, and railways expanded extraction, with large operations like Benguet Mining Company (1903) at Mankayan Copper Mine leading the way (Schreurs, 1985).

After independence in 1946, firms such as Lepanto Consolidated grew further. Yet mining's expansion displaced communities, degraded ecosystems, and fueled conflicts over land rights and indigenous sovereignty (Bryant, 1998).

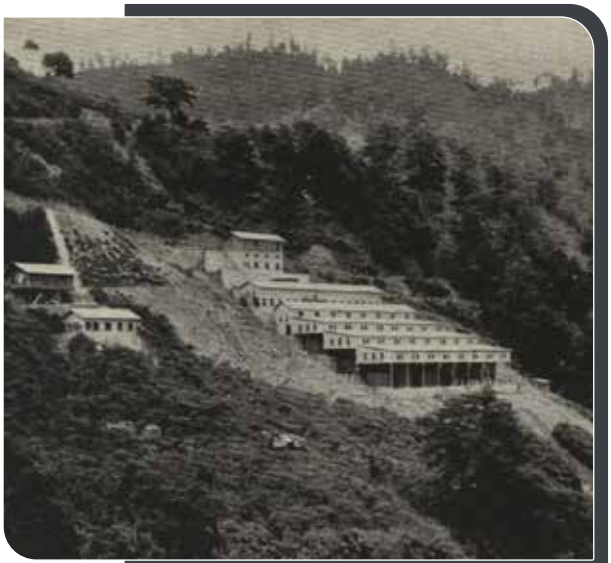


Figure 11: View of the New Baguio Gold Mining Co. Mill. Construction. Source: *a Journal for Philippine Builders* (September 1933)



Figure 12: Coconuts gathered on a coconut farm, P.I. Keystone View Company, 1910. © Lantern Slide

Coconuts

The coconut (Cocos nucifera) has long been central to Philippine agriculture and economy, valued for food, drink, fiber, and oil. The Philippines became one of the world's top producers of copra and coconut oil, shaping livelihoods across coastal and lowland areas.

Before colonisation, indigenous communities integrated coconuts into mixed farming systems. Spanish rule saw cultivation expand, though the sector remained subsistence-based as colonial focus rested on sugar, tobacco, and abaca (Corpuz, 1997). By the 19th century, coconut oil entered global markets, but its transformation came under American rule. Between 1910 and 1926, coconut lands nearly tripled, with expansion in southern Luzon, Bicol, and Eastern Visayas (Cerepak, 2016).

By the 1920s, the Philippines was the world's leading exporter, supplying soap, margarine, cosmetics, and wartime glycerin. U.S. tariff policies accelerated growth, and by the 1930s, an estimated 30% of Filipinos depended on coconut farming (Wickizer & Bennett, 1941).

Post-independence, the industry faced persistent challenges: fragmented landholdings, ageing trees, volatile global prices, and limited value-added processing, issues addressed unevenly by the Philippine Coconut Authority from the 1970s onward.

References:

Ahern, G. P. (1901). Report of the chief of the Forestry Bureau. Insular Government of the Philippine Islands.

Abinales, P. N., & Amoroso, D. J. (2005). State and society in the Philippines. Rowman & Littlefield.

Aguilar, F. V. (1994). Beyond inevitability: The opening of Philippine provincial ports in 1855. Journal of Southeast Asian Studies, 25(1), 70-90.

Aguilar, F. V. (2010). Clash of spirits: The history of power and sugar plantation in colonial Philippines, 1760–1898. University of Hawaii Press.

Aguilar, F. V. (2017). Colonial sugar production in the Spanish Philippines: Calamba and Negros compared. Journal of Southeast Asian Studies, 48(2), 237–261. doi:10.1017/S0022463417000066

Aldaba, R. M. (2008). Trade liberalization and Philippine manufacturing: Evidence and issues. Philippine Journal of Development, 35(1), 63–94.

Anderson, B. (1983). Imagined communities: Reflections on the origin and spread of nationalism. Verso.

Asian Development Bank (ADB) (2007). Philippines: Critical Development Constraints. https://www.adb.org/sites/default/files/publication/29274/cdc-philippines.pdf

Asian Development Bank (ADB). (2013). Leveraging Service Sector Growth in the Philippines. ADB Economics Working Paper Series No. 366. Manila: Asian Development Bank. https://www.adb.org/sites/default/files/publication/30385/ewp-366.pdf

Bankoff, G. (2004). Cultures of disaster: Society and natural hazard in the Philippines. RoutledgeCurzon.

Bryant, R. L. (1998). Indigenous peoples and the state: The political economy of land rights in the Cordillera region. Philippine Studies, 46(4), 435–455.

Boquet, M. (1923). Philippine lumber: Production, trade and utilization. Manila Bureau of Printing.

Borras, S. M. (2007). Pro-Poor Land Reform: A Critique. University of Ottawa Press.

Canlas, D. B. (2015). The Philippines: on the road to being an emerging economy. The Philippine Review of Economics, 52(2), 65-83.

Cerepak, P. (2016). Coconuts: Catalysts of conflict. Edge Effects. https://edgeeffects.net/coconuts-conflict/

Claudio, L. (2017). Liberalism and the postcolony: Thinking the state in 20th-century Philippines. National University of Singapore Press.

Constantino, R., & Constantino, L. (1975). A history of the Philippines: From the Spanish colonization to the Second World War. Monthly Review Press.

Corpuz, O. D. (1997). An economic history of the Philippines. University of the Philippines Press.

Corpuz, O. D. (1997). An economic history of the Philippines. University of the Philippines Press.
Cossons, N. (2012). Why preserve the industrial heritage? In Douet, J. (Ed.), Industrial heritage re-tooled: The TICCIH guide to industrial heritage conservation. The International Committee for the Conservation of the Industrial Heritage (TICCIH).

Dolan, R. (ed.). (1991). Philippines: A Country Study. Washington: GPO for the Library of Congress.

Funtecha, H. F. (1992). The making of a "Queen City": The case of Iloilo 1890s-1930s. Philippine Quarterly of Culture and Society, 20(2/3), 107–132. http://www.jstor.org/stable/29792083

Habito, C. F., & Medalla, E. M. (2001). Structural adjustment and economic reform: East Asia, Latin America, and Central and Eastern Europe. In Philippine Institute for Development Studies Discussion Papers.

Henares, I. (2022). Philippine industrial heritage management roadmap 2022-2025. Manila: TICCIH Philippines. Ileto, R. C. (2006). Pasyon and revolution: Popular movements in the Philippines, 1840-1910. Ateneo de Manila University Press.

Ileto, R. C. (2006). Pasyon and revolution: Popular movements in the Philippines, 1840-1910. Ateneo de Manila University Press.

Junker, L. L. (1999). Raiding, trading, and feasting: The political economy of Philippine chiefdoms. University of Hawaii Press.

Kahle, M. (2016). The tobacco monopoly in the Philippines: State, market and society. Journal of Southeast Asian Studies, 47(2), 234–256. https://doi.org/10.1017/S0022463416000056

Kramer, P. A. (2006). The blood of government: Race, empire, the United States, and the Philippines. University of North Carolina Press.

Kummer, D. M. (1992). Deforestation in the Postwar Philippines. University of Chicago Press.

Lara, F. J., & Morales, M. (2011). Insurgents, Clans, and States: Political Legitimacy and Resilience in the Philippines. Ateneo de Manila University Press.

Larkin, J. A. (1972). The Pampangans: Colonial Society in a Philippine Province. University of California Press.

Larkin, J. A. (1984). The International Face of the Philippine Sugar Industry: 1836–1920. Philippine Review of Business and Economics, 21(1 & 2), 39–58. Retrieved from https://pre.econ.upd.edu.ph/index.php/pre/article/view/332/0

Legarda, B. (1999). After the galleons: Foreign trade, economic change & entrepreneurship in the nineteenth-century Philippines. Ateneo de Manila University Press.

Legarda, B. (1999). After the galleons: Foreign trade, economic change & entrepreneurship in the nineteenth-century Philippines. Ateneo de Manila University Press.

Lopez, M. L., & Mendoza, F. (1987). A Study on the Philippine Sugar Industry Factors Affecting Its Decline (1972–1986). De La Salle University Animo Repository. Retrieved from https://animorepository.dlsu.edu.ph/etd_bachelors/3432

Lumbera, B. (2000). History of mining in the Philippines during the Spanish colonial period. Ateneo de Manila University Press.

McCoy, A. W. (1982). Anarchy of families: State and family in the Philippines. University of Wisconsin Press.

Merrill, E. D. (1903). Plants and peoples of the Philippines. Bureau of Printing.

Munoz, C. M. (2010). Growing Gold: A History of the Pampanga Sugar Development Company (PASUDECO), 1918–1939. De La Salle University Animo Repository. Retrieved from https://animorepository.dlsu.edu.ph/etd_bachelors/2447

Nagano, Y. (2007). The Collapse of the Sugar Industry in Negros Occidental and Its Social and Economic Consequences. Kasarinlan: Philippine Journal of Third World Studies, 3(3), 59–64. Retrieved from https://www.journals.upd.edu.ph/index.php/kasarinlan/article/view/620

Owen, N. G. (1971). The rice industry of the Philippines: 1850–1940. Yale University Press.

Peluso, N. L., & Vandergeest, P. (2001). Genealogies of the political forest and customary rights in Indonesia, Malaysia, and Thailand. Journal of Asian Studies, 60(3), 761–812.

Philippine Coconut Authority. (2011). The coconut comes full circle: The tree of life rediscovered. The Philippine Star. https://www.philstar.com/business/science-and-environment/2011/10/13/736361/coconut-comes-full-circle-tree-life-rediscovered

Sajor, L. (1986). The Sugar Industry and the Philippine Economy. Ateneo de Manila University Press.

Sajor, L. (1986). The Sugar Industry and the Philippine Economy. Ateneo de Manila University Press.

Schmitz, H. (1992). Coping with a fast-changing environment: The coconut industry in the Philippines. International Institute for Environment and Development.

Schreurs, M. A. (1985). Mining and the Philippine economy: Historical perspectives. Philippine Studies, 33(4), 430-450.

Schurz, W. L. (1939). The Manila Galleon. E. P. Dutton & Co.

Scott, W. H. (1982). Cracks in the parchment curtain and other essays in Philippine history. New Day Publishers.
Scott, W. H. (1994). Barangay: Sixteenth-century Philippine culture and society. Ateneo de Manila University Press.

Sonza, D. P. (1985). The Port of Iloilo: Its role in the development of Western Visayas. The Journal of History, 30-31(1-2), 101-114.

Sugar Regulatory Administration (SRA). (n.d.). Historical Records and Industry Data.
Sugar Regulatory Administration (SRA). (2020). Annual Industry Reports. Philippine Statistics Authority (PSA). (Various years). Sugarcane Industry Statistics.

Tadem, E. C. (2005). "The Political Economy of Sugar: Industry Policy and Crony Capitalism in the Philippines." Philippine Political Science Journal, 26(49), 123–150.

Tiongson, N. G. (2013). Indigenous labor in colonial Philippine mining. Asian Journal of Social Science, 41(1-2), 152-170.

Valdez-Bubnov, I. (2020). Trade, war and industrial policy in Southeast Asia: Spanish shipbuilding outside the Philippine Islands (1619–1753). War & Society, 40(1), 43–63. https://doi.org/10.1080/07292473.2021.1860321

Wickizer, V. D., & Bennett, M. K. (1941). The Philippine Agricultural Industry. Stanford University Press.

Balara Filters Park



Figure 1: Cerro de Carriedo, an Aguas Potables water tower within the park, dedicated to philanthropist Francisco Car¬riedo y Pedero who funded the country's first water system. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Contributors:
Timothy Augustus Y. Ong
TICCIH Philippines

Ivan Anthony S. Henares
Asian Institute of Tourism,
University of the Philippines,
Diliman

State, Province, Region
The Philippines
Pansol, Quezon City,
Metro Manila

Industrial Classification
Infrastructure
Industrial Communities

Further Details on the Industrial Classification
The Balara Filters Park forms part of the operational Balara Filtration Plant system, a critical component of Metro Manila's mid-20th-century water purification and distribution network that includes the La Mesa Dam (1929), Ipo Dam (1936), and Angat Dam (1967). It uniquely integrated education and leisure as the country's first public swimming resort and functioned as a recreational and educational space that informed the public about the then novel water treatment process.

Brief description

Balara Filters Park is the public-facing leisure component of the Balara Filtration Plant system that forms part of the greater La Mesa–Balara waterworks complex. This was and still is an essential infrastructure supplying Metro Manila's potable water since the 1930s. Developed in 1953 by the Metropolitan Water District, the park sits adjacent to the still-operational treatment facility. Its key tangible elements include early 20th-century Art Deco structures, and one of the country's first public swimming pools. As a public park and due to its adjacency to the La Mesa Watershed, it is a component of one of the last remaining rainforests of Metro Manila. Also notable is Escoda Hall, designed by National Artist for Architecture Francisco Mañosa, introducing Filipino vernacular elements in the primary poolside social venue of the park.

The park is historically significant as a crucial battleground for the security of Manila's water supply in World War II. It has also served as a workers' and public recreation ground, integrating health infrastructure with landscaped civic space, which was eventually opened up to public use. Despite periods of closure and neglect, the park remains a cultural landmark for Quezon City residents, linked to educational outings, family gatherings, and mid-century leisure culture.

In relation to *the Twentieth-Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), Balara Filters Park's role as an essential infrastructure supplying Metro Manila's potable water forms part of Theme 2: Accelerated Scientific and Technological Development. Its Art Deco structures serving as one of the country's first public swimming pools form part of Theme 8: Popular Culture and Tourism. Lastly, the site, being one of the last remaining rainforests within Metro Manila, also aligns with Theme 7: Conserving the Natural Environment.



Figure 2: The Balara Filtration Plant, one of the earliest structures of the complex. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO



Figure 3: The Manila Waterworks System. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Period(s) of operation

The Balara Filtration Plant was established in 1938 and began operations as part of Manila's expanding water supply system under the Metropolitan Water District. Following World War II, the Balara Filters Park was constructed and opened to the public, serving as a recreational and educational space from 1953 through the 1970s, with peak use in the 1950s–60s. It fell into neglect in the late 20th century but remained intermittently accessible. In 2025, the Quezon City Government initiated a phased rehabilitation programme to restore public amenities. The adjacent filtration plant remains operational, making the site unique for its continuity of infrastructure use alongside evolving civic functions.

Key events/chronology and changes to relevant attributes

1930s- Ownership of the Hacienda de Dilimán is ceded by the Tuason family to the Philippine Commonwealth.

1938- The Balara Filtration Plant is constructed by the Metropolitan Water District as part of Manila's water system

1945- The Balara Filters becomes the site of a skirmish between Japanese saboteurs and US American cavalry in World War II.

1949- Leisure amenities, including the rest house and swimming pools, are constructed.

1953- The Balara Filters Park is opened to the public as a pool resort.

1970s- The Metropolitan Water District was replaced by the Metropolitan Waterworks and Sewerage System (MWSS); the complex was closed to the public during the Marcos Dictatorship.

1997- The MWSS is privatized; the Balara Filters is turned over to Manila Water.

2003- The Balara Filters Park is reopened to the public.

2025- The Balara Filters Park undergoes rehabilitation after COVID-19-induced closure.

Status of the research and historical documentation

Documentation and historical research on Balara Filters Park remains limited and is primarily focused on the broader water supply system for Metro Manila rather than the park itself. Restoring Manila's Water System to Service by Lloyd K. Clark (1946) provides postwar context on reactivating the city's water infrastructure, while Fellizar (1994) discusses urban water management strategies, including reference to Balara as a key facility. Akpedonu and Saloma's study (2022) on urban green spaces touches on the park as an unintended civic space shaped by unrealized masterplans.

Historical development of the site, including the vision of the waterworks and its implementation, was covered in depth in the American Chamber of Commerce Journal in the 1930s. The architecture of Escoda Hall, attributed to National Artist Francisco Mañosa, is discussed in the exhibit catalogue Mañosa: Beyond Architecture (2022), offering detailed images of this later addition.

However, there are no academic monographs or technical papers focused exclusively on Balara Filters Park or the La Mesa–Balara water treatment ensemble. Records on park development and recreational planning remain scattered across MWSS archives and local government offices and are not yet digitized or consolidated. Existing documents are primarily in English and Filipino. Key gaps include the absence of architectural surveys, conservation assessments, and social history accounts of the park's civic use.



Figure 4: Balara Filters Park at present undergoing restoration. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO



Figure 5: Roof detail of the Philippine vernacular architecture-inspired Escoda Hall. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Current status and state of conservation
Balara Filters Park is partially functional and undergoing phased rehabilitation. While the adjacent filtration plant remains operational, many of the park's venues, such as the amphitheatre, fountains, pool complex, and Art Deco structures, have suffered from decades of neglect, vandalism, and weathering. Some original sculptural and architectural elements survive but are in varying states of deterioration. Recent efforts by the Quezon City Government in 2025 have restored some amenities for public use while preserving historical features. Particularly, the Picnic Grove and linear park are now accessible. However, much of the site remains disused or in disrepair, pending further conservation works, including the Balara Swimming Pool.

Known threats
Balara Filters Park faces ongoing threats from neglect, vandalism, and exposure to the elements, which have led to the deterioration of recreational structures and sculptural features. Overgrown vegetation, informal use, and lack of consistent maintenance have accelerated physical decay, especially in the plazas, fountains, and the public pool.

Protection status
As a work of National Artist Francisco Mañosa, Escoda Hall within Balara Filters Park is protected under the National Cultural Heritage Act, which prohibits its demolition or alteration without proper authorization. The park is also adjacent to the La Mesa Watershed Reservation, a legally protected area for environmental conservation.

Registration status in the national or local inventory
The Balara Filters Park is listed on the Philippine Registry of Heritage as a Registered Property of Quezon City. Furthermore, Escoda Hall is a work of National Artist for Architecture, Francisco Mañosa.

Ownership
The Balara Filters Park is owned by the Metropolitan Waterworks and Sewerage System (MWSS), a government-owned and controlled corporation. Portions of the site are co-managed with the Quezon City Government, especially areas undergoing rehabilitation for public use, though the filtration plant remains under MWSS jurisdiction.



Figure 6: Original welcome marker for the Balara Swimming Pool complex. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

References:
LakanSining (2016) Katipunan Avenue, Quezon City: The Balara Filtration Park. [online] 14 July. Available at: https://lakansining.wordpress.com/2016/07/14/katipunan-avenue-quezon-city-the-balara-filtration-park/ (Accessed: 4 August 2025).

Marsden, S. and Spearritt, P. (2021) The Twentieth-Century Historic Thematic Framework: A Tool for Assessing Heritage Places. Los Angeles: Getty Conservation Institute

Manila Customs House
Bureau of Customs Building



Figure 1: Construction of the Manila Customs House, c. 1930s. Source: John Tewell Collection. CC BY-NC 2.0

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Muelle de San Francisco, Port Area, Manila, Metro Manila

Industrial classification
Transport

Further details on the industrial classification
The Manila Customs House forms part of the broader Port and Harbor Network Ensemble of Manila, which includes other American and Commonwealth-era structures such as Pier 7, the Bureau of Quarantine, warehouses, and the nearby Port Authority buildings. Together, these neoclassical and Art Deco structures reflect the unified vision of early 20th-century colonial planning and infrastructure development in the Far East.

Brief description

The Manila Customs House, completed in 1939, is a prominent Beaux-Arts civic structure located at the Port of Manila. Designed by Antonio Toledo, a pioneering Filipino architect and former pensionado, the building adapts neoclassical design to the maritime and tropical setting of the Philippine capital. Its U-shaped, courtyard layout with tall arched windows allows for natural ventilation and daylighting, while its towering octagonal structure functioned as both a visual landmark and a lighthouse for ships entering the harbour.

Constructed of reinforced concrete, the building replaced the old customs house in Intramuros and continued to serve its original function as the headquarters of the Bureau of Customs until the structure was damaged by fire in 2019.

The site is strongly associated with international commerce and maritime customs and reflects the legacy of American-period planning and governance, particularly the influence of Daniel Burnham's 1905 Plan for Manila. Burnham's City Beautiful proposal advocated monumental public architecture and planning ensembles as instruments of moral and social order within the ideological framework of American imperialism's 'civilizing' mission within its new colony. The plan formalized the logistics of earlier military port expansion works between 1900 and 1903, positioning the Manila port as a commercial gateway for the Philippines as a strategic American outpost in Asia.

Antonio Toledo, as a pensionado (government-scholar) trained in the United States in his responsibility as Consulting Architect within the Bureau of Public Works, was tasked with the continuing modernisation of the port, localising classical and Beaux Art planning ideals into the Philippine context. The Customs House thus served as the principal structure within what was then the most modern port complex and largest passenger pier in the country, an architectural landmark framing the first formal encounter between visitors and the planned civic landscape of Manila.



Figure 2: Reconstructed Customs Building, c. 1950. Source: Francis Matthews Papers. Public domain

In relation to *the Twentieth-Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), the Custom House's maritime infrastructure development is in line with Theme 2: Accelerated Scientific and Technological Development. Its continuous use as the headquarters of the Bureau of Customs forms part of Theme 4: World Trade and Global Corporations, while its role as part of the legacy of American-period planning and governance and translating classical architectural principles into the Philippine context forms part of Theme 6: Internationalisation and Theme 1: Growth of Large Cities.

Period(s) of operation

The Manila Customs House has been in continuous operation since its completion in 1939, serving as the main headquarters of the Bureau of Customs. It replaced the Spanish-era Aduana building located in Intramuros. Damaged during World War II, it was restored under the Philippine Rehabilitation Act of 1946.

Key events/chronology and changes to relevant attributes

1937- Construction on the Manila Customs House commences.

1939- The Customs House is completed.

1945- The Manila Port Area is heavily shelled during the Battle of Manila; however, the structure survives relatively intact.

1946- Restoration of the Bureau of Customs building is completed under the Philippine Rehabilitation Act.

2019- The building suffered extensive damage from a fire, and was declared unsafe



Figure 3: Bureau of Customs Clock Tower detail. © Stephen Pamorada

Status of the research and historical documentation

There is limited archival documentation on the Manila Customs House readily accessible to the public. Scattered historical photographs exist in the Harry S. Truman Library archive, the John Tewell collection, and in digitized issues of the Port of Manila and Other Philippine Ports Yearbook.

Cursory references to the building can be found in the Masterbuilders documentary and in the City Sense newspaper column by Paulo Alcazaren.

While records may exist in the archives of the Bureau of Public Works (BPW) and the National Historical Commission of the Philippines (NHCP), these have not been formally verified or catalogued.

To date, no comprehensive academic or technical study has been published on the site's design, construction, or operational history, underscoring the need for expanded research and systematic archival recovery in the future.

Current status and state of conservation
Following the 2019 fire, the Manila Customs House has remained inaccessible to the public and is no longer in use as the central office of the Bureau of Customs. The exterior envelope and primary architectural features, including the courtyard configuration and iconic tower, appear largely intact. The reinforced concrete façades survive, although visibly fire-damaged. Post-fire photographs document extensive burn marks and the warping of iron elements throughout the structure. More recent satellite imagery from 2026 indicates that the roof has substantially collapsed and that the interior has been completely gutted. At present, no publicly confirmed plans for restoration or rehabilitation have been announced.



Figure 4: 100 Year Commemorative Marker. © Stephen Pamorada

Known threats
In the aftermath of the 2019 fire, the Manila Customs House remains vacant and unsecured, with the roof largely collapsed and the interior completely gutted as of 2026. This prolonged state of exposure significantly heightens its vulnerability to further structural deterioration, material decay, and potential loss of remaining architectural fabric. The surviving reinforced concrete façades, already affected by fire damage, burn scarring, and warped iron elements, are now subject to accelerated weathering without adequate protective enclosure.

Development pressures from surrounding port expansion and commercial infrastructure risk disrupting its historical setting and viewshed. Proximity to the waterfront exposes the structure to rising sea levels and increased flood risk, which may accelerate deterioration. Additionally, neglect and insufficient maintenance over the years have led to visible wear, including water damage, and façade discoloration, which may be symptomatic of deeper problems associated with coastal reinforced concrete structures.

While the building is legally protected, conservation funding and enforcement mechanisms remain limited. There are currently no large-scale, coordinated restoration measures in place.

Furthermore, as of 2025, the Bureau of Customs has revealed plans to construct a new main office building in Manila. The fate of the current Manila Customs House may thus be put into question following this shift in its role in the near future.

Protection status
The Manila Customs House is protected as an Important Cultural Property under Philippine law, with oversight by the National Museum and NHCP.

Registration status in the national or local inventory

The Bureau of Customs Building is listed on the Philippine Registry of Heritage as an Important Cultural Property by the National Museum and as a Marked Structure by the NHCP. It is subject to legal protection and conservation oversight under the National Cultural Heritage Act (RA 10066).

Ownership

The Manila Customs House is owned by the national government of the Republic of the Philippines. It is under the jurisdiction of the Bureau of Customs, an attached agency of the Department of Finance, which is responsible for its administration, maintenance, and continued use as a government facility.



Figure 5: Bureau of Customs Facade today. © Stephen Pamorada



Figure 6: Bureau of Customs Facade today. © Stephen Pamorada

Abaca Heritage of Davao

Ohta Development Company, Mintal Plantation Company, and other Japanese-Filipino abaca corporations in Davao, remnants of which are concentrated within Barangay Mintal Japanese Heritage Site and at Port Santa Ana



Figure 1: Sta. Ana Port Today © Sheena Marie Franco

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Davao City, Davao

International Designations
A Philippine-Japan Historical Museum has been established in Calinan to celebrate the close historical ties between communities from the two nations in Davao.

Industrial Classification
Agricultural & Fishing Infrastructure
Industrial Communities
Textiles

Further details on the industrial
Classification Driven by Japanese-Filipino enterprises such as Ohta Development Company, Davao (Mindanao) was the centre of abaca fibre cultivation and rope production, essential for shipbuilding. In fact, road networks in Davao were private enterprises in support of the abaca trade. Schools, hospitals, residences, and a cemetery formed a transnational industrial enclave of which traces are present within Barangay Mintal.

Brief description

Barangay Mintal Japanese Heritage Site in Davao City contains the tangible remnants of the pre-war Japanese-Filipino abaca industry led by the Ohta Development Company and its affiliates. Known as 'Little Tokyo', Mintal was the administrative and cultural heart of Japanese settlement in Mindanao, with a built environment influenced by the industrial, agricultural, and community infrastructure of abaca production and processing developed between 1903 and 1941. The Ohta Obelisk of 1926 (also known as the Ohta Kyozaburo Monument), the ruins of the old Mintal Hospital, and the Japanese cemetery are still extant remains of this agroindustrial centre. Also, the pre-Bureau of Public Works road network leading to Port Sta. Ana, and the port itself through which abaca goods were exported, remains in use. Remnants of the Ohta Development Company's hydroelectric power plant and the complex of irrigation canals are present, with segments integrated into the locality's current utilities grid.

Residential structures within Mintal and Davao in general exhibit Japanese construction practices and stylistic influences such as irimoya-style roofs, influenced by an influx of Japanese laborers and daiku (carpenters), representing the domestic legacy of migrant workers and entrepreneurs who settled in Davao.

The site is historically significant as the centre of economic activity in the southern Philippines during the early 20th century, producing up to 80% of the world's abaca rope supply at its peak. It also played a key role in shaping Davao's urban development, labor migration, and intercultural exchanges. While most Japanese residents were repatriated or detained after World War II, local narratives, place names, and oral histories maintain the memory of the Mintal enclave.

The Ohta Obelisk at the Mintal Elementary School is one of the remaining traces of this Japanese past, with the pyramid destroyed by treasure hunters shortly after World War II. The Mintal Japanese Cemetery also houses the remains of many Japanese abaca pioneers, with a 2017 Monument of No Regret forming the core of this commemorative effort. The communities in Davao and Japan are working on making this industrial community's narrative more known in cooperation with IMIN - The Philippine-Japan Historical Museum and the Tourism Infrastructure and Enterprise Zone Authority of the Philippines. Notably, the Dakudao Mansion of Dr. Santiago P. Dakudao, Sr., physician-in-residence of the Mintal Hospital is at present a family mausoleum.



Figure 2: Monument of No Regrets at the Mintal Japanese Cemetery grounds © Sheena Marie Franco



Figure 3: Archival image of the Obelisk and the Japanese Pyramid shortly after construction. Source: Make It Davao. CC-BY-NC-SA 3.0

The development of the abaca community of Davao may be situated within *the Twentieth-Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C); under Theme 1: Rapid Urbanization and the Growth of Large Cities, the formation of a Japanese settler community emerged directly from the strategic cultivation and export of abaca, catalyzing the establishment of roads and highways connecting plantations, port facilities, and the commercial district of Davao. Under Theme 2: Accelerated Scientific and Technological Development, abaca's cultivation as the world's premier cordage fiber for maritime applications aligned with periods of concentrated control over production during peak global demand. Finally, under Theme 4: World Trade and Global Corporations, Davao's abaca industry became embedded within transnational Japanese–Filipino corporate networks that linked Mindanao to global markets, demonstrating how migration, capital flows, and commodity exchange reshaped local landscapes in the twentieth century.

Period(s) of operation

Japanese abaca plantations began in the early 1900s, with Ohta establishing his company in 1903. Operations expanded into the 1930s, when Mintal was named 'Little Tokyo' as a major Japanese community in the Philippines. Operations ceased during World War II, and at the end of hostilities, Japanese citizens were deported and businesses dismantled. While abaca production continued in Mindanao after the conflict, the original Japanese-led enterprise did not recover.

Key events/chronology and changes to relevant attributes

1903- First batch of Japanese migrant workers, led by Suda Ryosuke, arrive in Davao. Ohta Kyozaburo establishes an abaca plantation in Mintal.



Figure 4: Ohta Obelisk and Marker. © Sheena Marie Franco

1930s- Abaca production reaches its peak, with Davao supplying 80% of the world's needs.

1941- Davao becomes a key supply base of the Japanese Military.

1944- Allied campaigns push into Mindanao, disrupting the abaca trade.

1945- The Allies liberate Davao from Imperial Japanese control.

1946- Japanese immigrants are deported, and abaca production resumes under Philippine control.

1950s- Plantations redistributed; Mintal shifts to local abaca production; Philippine-Japanese relationship normalises.

1970s- Japanese descendants begin to return as tourists or researchers; local informal preservation of sites continues.

2003- Ohta Obelisk historic marker installed.

2020s- Restoration efforts for key structures (cemetery, obelisk) gain support; calls grow for national recognition and a formal inventory of remaining structures. Possible support from TIEZA is extended for the rehabilitation of the barangay.

Status of the research and historical documentation

Mintal is the subject of several theses and research proposals from Davao, and a book, Abaca Frontier: The Socioeconomic and Cultural Transformation of Davao, 1898–1941 by Patricia Dacudao.

The IMIN - The Philippine-Japan Historical Museum in Davao also has information on the Japanese settlements and their contribution to the abaca industry of Davao, and has been active in connecting the Mintal community with the Japanese through exhibitions, conferences, and documentation of oral histories in the locality.

This ongoing research, while particularly focused on the Japanese-Filipino legacy of the abaca industry in Davao, recognises the layered influences of Filipino, American, and Spanish corporations and labourers that have yet to be uncovered, and must be the focus of future research endeavours on this once thriving industry. Thus, many surviving sites remain unmarked and under-documented.

Current status and state of conservation

IMIN The Philippine-Japan Historical Museum has been active in documenting and promoting the Japanese-Filipino heritage of Mintal. The Ohta Obelisk and the Mintal Japanese Cemetery are in active use, and are being maintained by their local communities. Port Santa Ana is likewise maintained as an inter-island passenger ferry terminal. There is limited information on the protection status afforded residential and industrial



Figure 5. Text of the Monument of No Regrets. © Sheena Marie Franco

structures within Barangay Mintal, and further research on their current status and state of conservation is required.

Known threats

The site faces ongoing threats from road widening, new residential construction, lack of physical markers or legal protection, and natural deterioration due to climate and neglect. Informal settlements are present within some sites.

Protection status

Barangay Mintal has been declared a heritage site by the Davao City Government. The Ohta Obelisk, and Port Sta. Ana have historical markers. The Japanese Cemetery, as well as the Battle Memorial for the Battle for Mintal in World War II have received registered property status within Davao City. The Monument of No Regrets lies within the protected zone of the Japanese Cemetery. The extant irrigation canals, and remnants of the hydroelectric power grid are managed privately but are not protected by any listing at present.



Figure 6: Abaca plantation, and the Ohta Obelisk, Make it Davao CC-BY-NC-SA 3.0



Figure 7: Davao Pier and Approach - Sta. Ana Wharf, 1929. Source: Bureau of Public Works, Philippine Islands Yearbook. Public domain.



Figure 8: Ohta Marker by the Japan Philippines Volunteers Association, Inc. © Sheena Marie Franco

Registration status in the national or local inventory

The Ohta Obelisk, formally, the Ohta Kyozaburo Monument is a marked structure by the National Heritage Commission of the Philippines. The remaining registered properties are listed as local cultural properties within the City of Davao.

Ownership

The properties are under mixed ownership. The Ohta Obelisk (situated within a local school) and the cemetery are publicly owned. The houses are in active use in private hands. Aboitiz Power controls the Ohta Development Company's hydroelectric grid.

El Depósito, known today as the Museo El Deposito



Figure 1: A section of the El Deposito underground water reservoir accessible to the public. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Museo El Depósito, Pinaglabanan Shrine, San Juan, Metro Manila

International Designations
El Depósito is not currently recognized under any international convention or programme

Industrial Classification
Infrastructure

Further details on the industrial classification
El Depósito is an underground water reservoir constructed by the Spanish colonial authorities as part of the Carriedo Waterworks System, supplying the capital, Manila, and its surroundings

Brief description

El Depósito is a Spanish-era underground reservoir built in 1882 as the main storage facility of the Carriedo Waterworks, Manila's first modern water system. Located in San Juan, Metro Manila, the site consists of a 15-meter-long brick masonry cistern with vaulted ceilings, originally designed to hold 56,000 cubic meters of water. The cistern's original function to supply clean water to Manila's population was vital for urban health and infrastructure.

El Depósito's strategic function as the primary water supply for the capital also led to its involvement in many significant battles. It was the objective of the 1896 Battle of San Juan del Monte, the first major action of the Philippine Revolution and was later repurposed for military use as an armory by American and Japanese forces during the colonial era and World War II. It holds strong symbolic and emotional meaning for local communities, particularly as part of the larger Pinaglabanan Memorial Shrine dedicated to the battle that took place on-site.

Only a portion of the reservoir is currently open to the public. Above ground, a two-story interpretive centre, Museo El Depósito, features artifacts, scale models, and interactive modules and has three galleries that explore the infrastructure's inception and monumentalisation: Life before the Waterworks, The Carriedo Waterworks, and National Shrine.

Intangible attributes include the engineering knowledge introduced by Spanish and Filipino planners, such as Genaro Palacios, who adapted European hydraulic design to this tropical context. The legacy of Francisco Carriedo reflects early philanthropic urban planning. The cistern also preserves a legacy of urban water infrastructure, from colonial sanitation practices, revolutionary struggle, to the impact of war in the Pacific. El Depósito remains one of the largest remaining Spanish-era constructions in the country.

As an important water storage facility of the Carriedo Waterworks that served as Manila's first modern water system, the El Depósito falls under Theme 1:

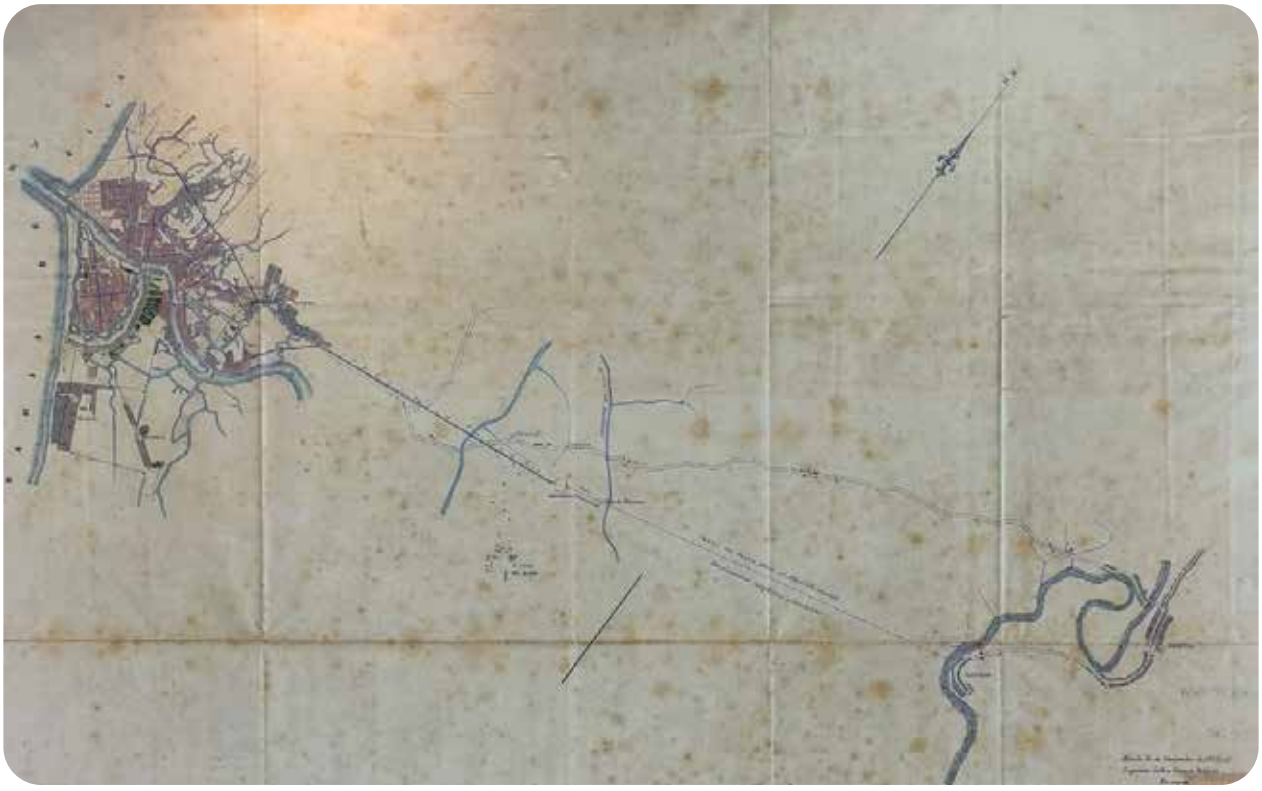


Figure 2: The Approved Carriedo Waterworks System, Archivos Estatales, Spain

Rapid Urbanisation and the Growth of Large Cities of the Twentieth-Century Historic Thematic Framework developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C). Its importance of supplying clean water to Manila's population, vital for urban health, falls under Theme 2: Accelerated Scientific and Technological Development. Its strategic location and role in many significant battles in history aligns with both Theme 6: New Nation-States and Theme 10: War and Its Aftermath. Lastly, its strong symbolic and emotional meaning as part of the larger Pinaglabanan Memorial Shrine is aligned with Theme 8: Popular Culture and Tourism.

Period(s) of operation

Groundbreaking on El Depósito commenced in 1878. The reservoir commenced operations in 1882 and supplied water to Manila until American occupation, which led to the conversion of the structure into an armory in 1903.

Following heavy damage in World War II, the structure was abandoned and used as a garbage dump, but saved from destruction when it was included within the Pinaglabanan Shrine, a protected landmark.

Preliminary archaeological excavations in 2016 precluded conservation works and the re-opening of the Museo El Depósito in 2019. The subsurface aqueducts were made accessible to the public in 2021.

Key events/chronology and changes to relevant attributes

1772- Francisco Carriedo y Peredo, arrives in Manila and makes a fortune in the Galleon Trade.

1783- Carriedo bequeaths 10,000 pesos to the city of Manila for a water line, however the original proposal was rejected.

1869- Engineer Genaro Palacios (who also worked on the San Sebastian Church) realizes the proposal through a new design capable of holding 56,000 cubic meters of water for Manila's population of 300,000.

1882- El Depósito is completed with a total cost of 110,000 pesos.

August 30, 1896- Philippine hero Andres Bonifacio and the Katipunan attempt to seize the waterworks in the Battle of San Juan del Monte, the first major action of the Philippine Revolution.

1903- the American forces in control of the El Depósito convert the reservoir into an arsenal

1942- Imperial Japanese forces capture the now-arsenal, and it continued its function as a military outpost, with its surface structures converted into a field hospital, firing range, and bunker.

1945- El Depósito is recaptured in the Philippine campaign. However, only the subsurface infrastructure remained intact.

Post-war period- The site remained abandoned and is used as a garbage dump.

1972- The National Historical Commission of the Philippines (NHCP) recognises the historical significance of the El Depósito and placed a marker on site.

1973- The Pinaglabanan Shrine, which encompassed the reservoir, is declared a National Shrine by the NHCP.

2016- The University of the Philippines Archaeological Studies Program commences archaeological excavations on site.

2018- NHCP commences rehabilitation works on the El Depósito site.

2019- The Museo El Depósito opens to the public.

November 30, 2021- the rehabilitated reservoir opens to the public.

Status of the research and historical documentation

El Depósito has been known both to historians and the public since its inception and throughout its changes in function over the past century. This is attested by the presence of historical sources including *Carriedo y sus obras* by Francisco de Mas y Otzet (1882), which documented the life of Francisco Carriedo and commemorated the inauguration of Manila's first water system. Other references include Gabelman's Hydraulic Engineering in the Philippines (1929), and Clark's Restoring Manila's Water System to Service (1946), and the NHCP's own articles such as When Water and Wine Flowed in Manila: The Inauguration of the Manila Waterworks in 1882 by shrine curator, Jonel Rabusa (2023). Formal archaeological work was undertaken in 2016 by the University of the Philippines Archaeological Studies Program (UP-ASP), in collaboration with the National Historical Commission of the Philippines (NHCP). The archaeological reports are accessible at the UP School of Archaeology, the NHCP archives, and at the on-site library.

Historic plans and engineering records are housed at the NHCP and in Spain's *Archivo Historic Nacional* and *Archivos Estatales*. A small collection of drawings, photographs, and maps is preserved at the *Museo El Deposito* and is accessible to the public.

Current status and state of conservation

The cistern, while no longer in use, is mostly structurally complete and has undergone extensive restoration in preparation for its conversion into a museum. The structure was cleared of waste and debris, and its masonry arches and walls reinforced and sealed to reduce water seepage. Steel decking and stairway access has been introduced into the portion of the underground cistern opened to the public. Above ground, a two-story museum and interpretative centre features artifacts related to the waterworks- historic plans, piping, fountains, fire hydrants, and archaeological finds on site; an audio-visual room, resource centre, and a virtual reality gallery that showcases the Carriedo waterworks' historical and engineering significance.

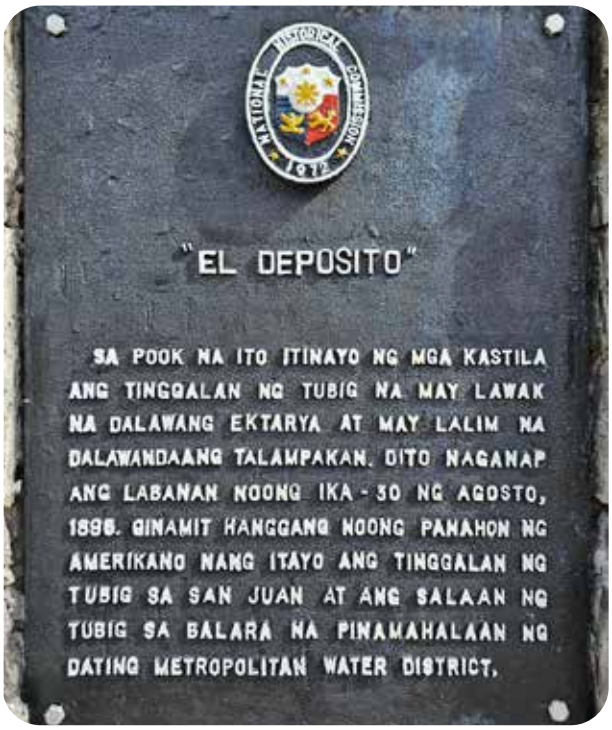


Figure 3: Historical Marker installed in 1972. Photograph by Andre Ryan Maceda. Source: Wikimedia Commons. CC BY-SA 4.0

Known threats

El Depósito currently faces threats owing to its subterranean structure and urban location in close proximity to a densely populated area. Groundwater infiltration, high humidity, and mold growth pose long-term risks to the cistern's masonry and its accessibility to the public. Initial threats brought about by neglect such as vandalism and waste disposal have been addressed through its conversion into a museum, while structural retrofitting has reinforced seismically vulnerable sections of the heritage site.

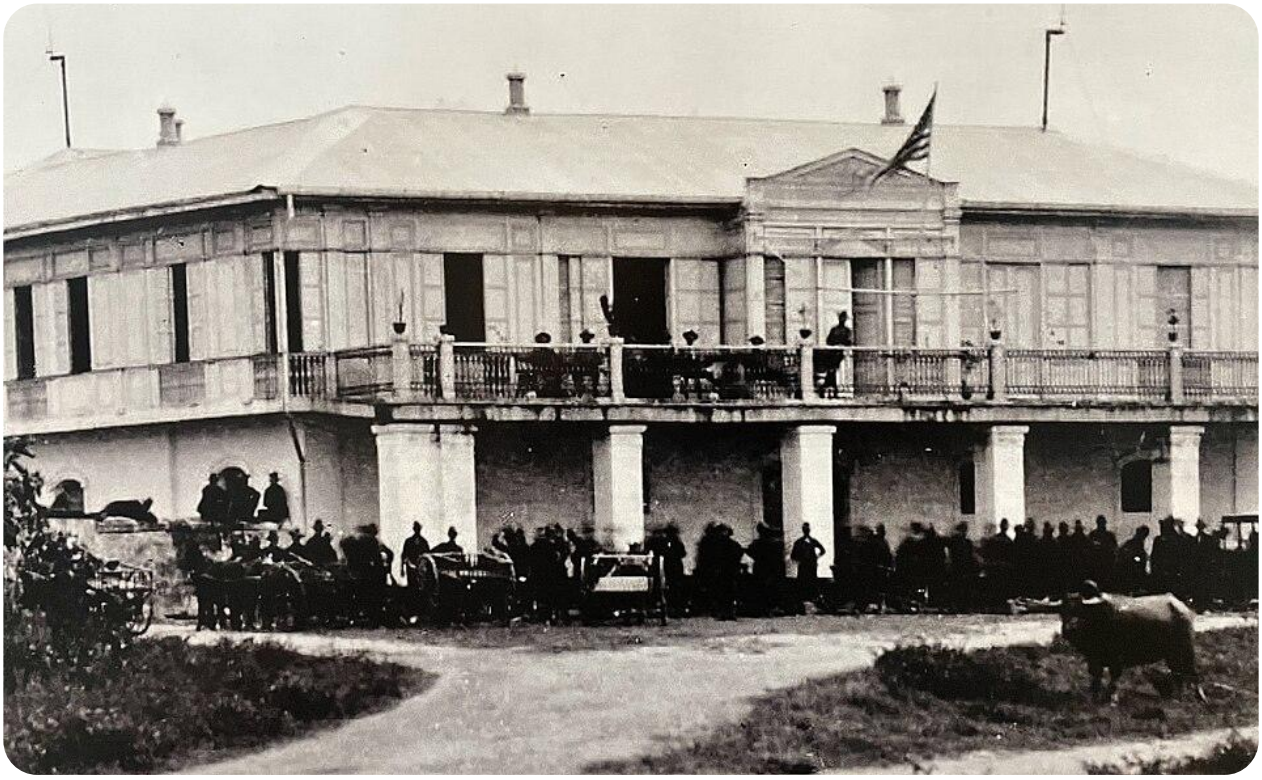


Figure 4: El Deposito hoisting the flag of the United States of America. Photograph by Pavl Anthøny. Source: Wikimedia Commons. CC BY-SA 4.0

Protection status
El Depósito is protected as part of the Pinaglabanan Memorial Shrine. El Depósito is also a marked structure of the NHCP. It is covered by the National Cultural Heritage Act (R.A. 10066) and maintained through NHCP-led restoration, museum construction, and site management by the San Juan LGU.

Registration status in the national or local inventory
The El Depósito Underground Tunnel is registered on the Philippine Registry of Heritage as a Marked Structure of the NHCP and as a Registered Property of the City of San Juan.

Ownership
El Depósito is publicly owned and managed by the City Government of San Juan, in coordination with the National Historical Commission of the Philippines (NHCP). It forms part of the Pinaglabanan Memorial Shrine complex and is maintained as a heritage and educational site under local and national government oversight.

Local contacts
The Museo El Depósito can be reached through information provided on the website of the National Historical Commission of the Philippines:
Museo El Deposito

Address: Pinaglabanan Memorial Shrine, Pinaglabanan St., Corazon de Jesus, San Juan City

Hawaiian-Philippine Company Sugar Central



Figure 1: A worker demonstrates the operation of a sugarcane press. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Contributors:
Pauline Basilia
Interdisciplinary Studies, Institute of Arts and Sciences, Far Eastern University, Manila
Professorial Lecturer, School of Archaeology, University of the Philippines Diliman

Timothy Augustus Y. Ong
TICCIH Philippines

Ivan Anthony S. Henares
Asian Institute of Tourism, University of the Philippines, Diliman

State, Province, Region
The Philippines
Silay City, Negros Occidental

International Designations
The site is part of the Philippine Tentative List for UNESCO World Heritage under *The Sugar Cultural Landscape of Negros and Panay Islands*.

Industrial Classification
Agricultural & Fishing
Food & Drink Processing
Industrial Communities

Further details on the industrial classification

The Hawaiian-Philippine Company Sugar Central, established in 1918, exemplifies the large-scale industrialisation of sugar production in Negros Occidental. Introduced during the American colonial period, it reflected the central factory model that replaced small hacienda-based mills with mechanized, steam-powered, and later electric-driven processing. Its foundation was supported by American investment and technology transfer, linking local production to global markets. As one of the earliest and most enduring centrals, it represents the transition to industrial agro-processing in the Philippines, and remains integral to the regional identity of Negros at the centre of the sugar economy.

Brief description

The Hawaiian-Philippine Company (HPCo) is the oldest operational sugar central in Silay City, Negros Occidental. The current complex consists of the original central complex (transloader, cane shed, factory mill building), the cane railway infrastructure (bridge and line) and steam locomotives (locally called 'iron dinosaurs'), staff housing, recreational facilities, and a community chapel. The central complex has a working chimney/ smokestack (or 'stacks') that are essential components of sugar mills. The stack is visible from a distance and serves as a visual landmark in the area. The sugar mill and factory buildings were constructed between 1918 to 1920s, while the railway and the locomotives were built or acquired shortly after. The railway system is still in use, and the locomotives are maintained and used occasionally. Staff housing and company residences for the American and Filipino administrators, engineers, and skilled workers still stand in the complex. The homes, still occupied, used colonial-era designs. The central complex itself stands on approximately 14 hectares, surrounded by the sugar plantation with a total land area of 45 hectares.

In relation to the Twentieth-Century Historic Thematic Framework developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), the Hawaiian-Philippine Company, as one of the earliest large-scale sugar centrals in Negros, catalyzed the growth of a plantation-based company town in Silay, aligning with Theme 1: Rapid Urbanization and the Growth of Industrial Communities, with farmers, workers, and administrators residing within this integrated agro-industrial enclave town. The central's mechanized milling systems, steam-powered locomotives, and purpose-built cane railway infrastructure illustrate Theme 2: Accelerated Scientific and Technological Development, Theme 3: Mechanized and Industrialized Agriculture, and Theme 5: Transportation Systems and Mass Communications. Improvements in milling efficiency and the integration of rail transport enabled a continuous production chain from plantation fields to factory and onward to port, consolidating industrial agriculture at a regional scale. The survival of the working smokestack, railway bridge, and steam locomotives demonstrates how transport and processing technologies structured both the physical and economic landscape of sugar production, contributing to the Philippines' prominence in global sugar markets and reflecting Theme 4: World Trade and Global Corporations.

Period(s) of operation

The Hawaiian-Philippine Company was established on June 3, 1918 and was later managed by Welch, Fairchild & Co. Ltd. (1919), Theo H. Davies & Co., Far East Ltd. (1948), Jardine Davies Inc. (1974), then ownership came back to the Hawaiian-Philippine Company in 2003. The sugar central is currently in use.



Figure 2: One of HPCO's steam locomotives; in the background, the HPCO sugar refinery. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Key events/chronology and changes to relevant attributes

The Hawaiian-Philippine Company was built at the time when American colonists started their 'improvements' on an older system by Nicholas Loney. This site is an example of the American centralization of sugar production that decimated socio-economic structures, i.e., changes in waterways through the introduction of barge systems, introduction of the factory system in Guimaras, and movement of Filipino farmers to Hawaii (sacada migration). The Hawaiian-Philippine Company profile proudly states that it saw its beginnings as a testament to the American-Filipino 'friendship'. The owning company supports the promotion of the site as a culturally significant industrial heritage to give Filipino researchers time to decolonise its history.

Status of the research and historical documentation

Archaeological excavation has yet to be conducted on the site. As the site forms part of *The Sugar Cultural Landscape of Negros and Panay Islands*, one of the Philippines' Tentative List entries for World Heritage nomination, the related dossier collates most available information on the site; TICCIH Philippines likewise maintains an accessible report on its website.

Current status and state of conservation

The site is still in use. HPCO also maintains a fleet of the original steam trains in active operation for sugarcane transportation; it retains ownership, conducts maintenance, and operates both steam and diesel engine trains for industrial and tourism use.



Figure 3: Sugarcane awaiting processing. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO



Figure 4: Extant staff housing on site of HPCO. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Known threats
Since the site is privately-owned, locals fear that the owners could decide to tear down heritage structures, as it has happened in other areas of the Philippines. Market forces that determine the profitability of sugar and in turn the feasibility of operating sugar mills will be the primary factor that may lead to its disuse or closure.

Protection status
It is registered in the Talapamana ng Pilipinas, the Philippine registry of heritage.

Registration status in the national or local inventory
It is registered in the Talapamana ng Pilipinas, the Philippine registry of heritage. It is also a part of the Philippine Tentative List for UNESCO World Heritage under *The Sugar Cultural Landscape of Negros and Panay Islands.*

Ownership
The site is privately owned by the Hawaiian-Philippine Company.

The Minor Basilica and Parish of San Sebastian (Shrine of Our Lady of Mount Carmel)



Figure 1: The San Sebastian Basilica

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Quiapo, Manila,

International Designations
The San Sebastian Basilica was included on the biennial watchlist of the 100 Most Endangered Sites by the World Monuments Fund in 1998, and again in 2010.

Conservation efforts on the structure through the San Sebastian Basilica Conservation and Development Foundation have been conducted with and through the support of several international organisations including ICCROM (San Sebastian Basilica Sustainable Restoration Project); U.S. Embassy in the Philippines' Bureau of Educational and Cultural Affairs (Conservation of the 19th-Century San Sebastian Basilica (Phase 2), Manila); CyArk and Iron Mountain (Digital Documentation of the San Sebastian Basilica).

Industrial Classification
Engineering
Metallurgy
Religious Infrastructure

Further details on the industrial classification

San Sebastian Basilica highlights 19th-century engineering and metallurgy, being the only all-steel church in Asia and a rare example of prefabricated metal construction intended for a seismically active tropical context, and a collaborative international effort by Spanish engineers and Belgian foundries. Though primarily a place of worship, its engineering significance places it within the category of industrial heritage.

Brief description

Commissioned by the Augustinian Recollects in response to the repeated destruction of earlier stone churches on the site by earthquakes and fire, the San Sebastian Basilica, completed in 1891, is the only all-steel church in Asia and one of the few prefabricated metal churches in the world.

Engineered by Genaro Palacios (who also designed the El Depósito and Carriedo Waterworks) and prefabricated by the Belgian firm Société Anonyme des Enterprises de Travaux Publiques, the structure was shipped in prefabricated parts and assembled on-site. Rising 105 feet above Quiapo district, it utilised over 52 metric tons of riveted steel to form a fully prefabricated superstructure in neo-Gothic style and introduced European industrial technology to the tropics in addressing the challenges of fire risk and seismic activity. The basilica features twin openwork spires, a vaulted ceiling, stained-glass windows from Germany, and hand-painted trompe l'oeil interiors executed by Filipino artisans to imitate stone, a transnational collaborative effort.

The basilica's scale and all-metal construction were unprecedented in the Philippines at the time and remain technically and aesthetically remarkable. It maintains its function as a place of worship for the Catholic faith and has been recognised in the Philippines for its architectural and engineering importance as a designated and protected National Cultural Treasure.

As the only all-steel basilica in Asia, and one of the few prefabricated metal churches in the world, the San Sebastian Basilica can be categorised as part of Theme 9: Religious Institutions from *the Twentieth-Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C). Its engineering wonder rising 105 feet and utilizing over 52 metric tons of riveted steel that forms a fully prefabricated superstructure in the neo-Gothic style introduced in Europe and installed in the Philippines represents Theme 2: Accelerated Scientific and Technological Development and Theme 4: World Trade and Global Corporations.

Period(s) of operation

San Sebastian Basilica was completed and consecrated in 1891 and has remained in continuous active use as a place of worship for Roman Catholicism. It replaces earlier stone and wood churches on the same site lost to earthquake and fire over the centuries.

Key events/chronology and changes to relevant attributes

1621- Bernardo Castillo, patron and devotee of Saint Sebastian donates the land on which the church stands.

1651- San Sebastian Church established; original lost to fire during a Chinese Filipino uprising.

1859, 1863, 1880- succeeding structures destroyed by fires or earthquakes.

Late 1880s- Fr. Esteban Martinez commissioned Genaro Palacios to design an earthquake-resistant church; Palacios developed an all steel church in the Neo-Gothic style; Belgian foundry, Societe anonyme des Enterprises de Travaux Publiques is contracted to execute the design.

1888- The first of eight shipments of 52 metric tons of steel parts arrived in the Philippines.

June 24, 1890- Pope Leo XIII elevates the church to the status of minor basilica.

September 11, 1890- The first column of the church was installed; Belgian engineers supervised the construction

August 16, 1891- the Basílica Menor de San Sebastián was completed and consecrated by Manila Archbishop Nozaleda y Villa.

1934- Marker installed by the Historical Research and Markers Committee.

August 1, 1973- the church is designated as a National Historical Landmark of the Philippines.

1982- the church is afforded state funding for restoration by the National Historical Institute in response to increasing corrosion.

1998- the church was placed on the biennial watchlist of the 100 Most Endangered Sites by the World Monuments Fund

2006- San Sebastian Church was included by the National Historical Institute for the Philippine Tentative List for World Heritage Site nomination.

2010- the church was again placed on the biennial watchlist of the 100 Most Endangered Sites by the World Monuments Fund; San Sebastian Basilica Conservation and Development Foundation, Inc. was founded to focus on the conservation of the monument.

2011- the passage of the National Cultural Heritage Act (RA 10066); the church and all other Philippine sites removed from the World Monuments Fund listing; the church



Figure 2: San Sebastian under construction, c. 1890. Public domain

was declared a National Cultural Treasure, the highest designation for a heritage site in the country.

2015- The U.S. Ambassadors Fund for Cultural Preservation grants funding for the diagnosis and conservation of the church.

2019- Digital documentation and monitoring of the church by Cyark and Iron Mountain.

2023- San Sebastián Basilica: Ironclad Faith published documenting the history of the church and current efforts towards its sustainable conservation.

Status of the research and historical documentation

Research and documentation on San Sebastian Basilica began as early as the early 20th century but intensified in the 2010s with targeted conservation studies. Major efforts include structural assessments, historical mapping, and materials analysis initiated by the San Sebastian Basilica Conservation and Development Foundation (SSBCDF) from 2010 onward. These efforts as well as a comprehensive narrative of the structure's

history are found in the 2023 publication, San Sebastián Basilica: Ironclad Faith. The basilica was digitally documented in 2018 through a partnership between CyArk and Iron Mountain, resulting in a comprehensive 3D laser scan used to support monitoring and conservation and can be accessed in partnership with Google Arts & Culture, which is available online using the link here: San Sebastian Basilica — Google Arts & Culture.

Records include original design plans by Genaro Palacios, steel fabrication documents from Belgium, and photographs dating to the late 19th century. These are partially held by the SSBCDF, NHCP, and the Archdiocese of Manila, but access remains limited. There is no centralized archive, and many documents remain undigitized. Existing records are primarily in Spanish and English and are scattered on the web, or otherwise found in the 2023 publication or on the Facebook page of the San Sebastian Basilica Conservation and Development Foundation.

Current status and state of conservation

San Sebastian Basilica is structurally intact and is in active use as a place of worship. However, it is in a vulnerable state due to widespread corrosion, water infiltration, and the deterioration of hand-painted finishes and stained glass. Most original prefabricated steel components and interior artworks survive but require stabilization.

Conservation work is ongoing, including structural assessments, paint consolidation, and stained-glass restoration. In 2018, the site was digitally documented in 3D to support long-term monitoring and guide restoration planning.

Despite active use, the building's survival depends on continued conservation and control of external development pressures, particularly unchecked construction within its buffer zone.

Known threats

San Sebastian Basilica faces serious threats from widespread corrosion due to a saline environment, water infiltration and rising groundwater, causing structural steel elements and facade pieces to deteriorate and fall. Over 300 leaks have been recorded, and key steel columns show up to 75% section loss. Hand-painted trompe l'oeil finishes and faux stonework are flaking and require urgent consolidation. Heavy construction and high-rise developments within the buffer zone introduce ground vibration and endanger stability.

Ongoing conservation efforts led by the San Sebastian Basilica Conservation Foundation include structural reinforcement, detailed diagnostics, paint consolidation, and 3D digital documentation, but further funding and protection remain urgently needed.

Protection status

San Sebastian Basilica is a National Cultural Treasure protected under the National Cultural Heritage Act of 2009 as a Grade I property, the highest heritage protection in the Philippines, recognised for its 'unique' and outstanding historical, cultural, artistic, and scientific value and national significance.



Figure 3: San Sebastian Basilica (*De San Sebastian Kerk te Manila op de Filippijnen*), c. 1900. CC-BY 4.0



Figure 4: The church was declared of National significance as early as 1934. Photograph by Eugene Alvin Villar. Source: Wikimedia Commons. Public domain



Figure 5: Detail of dome drum showing trompe l'oeil and faux stonework on steel. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO



Figure 6: Exterior Façade. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Registration status in the national or local inventory

The San Sebastian Basilica is listed as a National Historical Landmark on Talapamana, the Philippine Registry of Heritage (PRH), the central repository on all information pertaining to significant cultural properties in the Philippines deemed significant to cultural heritage and is under the management of the National Commission for Culture and the Arts.

Ownership

The San Sebastian Basilica is a religious structure under the jurisdiction of the Roman Catholic Archdiocese of Manila and managed by the Order of the Augustinian Recollects which manage the adjacently located San Sebastian College-Recoletos.

Local contacts

The Save San Sebastian Basilica Conservation and Development Foundation, Inc. is an SEC-registered non-profit organisation leading the restoration effort on the basilica.

Spanish Lighthouses of the Philippines



Figure 1: Cape Bojeador Tower Detail. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Cape Bojeador Lighthouse, Burgos, Ilocos Norte
Cape Santiago Lighthouse, Barangay Bagong Silang, Calatagan, Batangas
Malabrigo Point Lighthouse, Barangay Malabrigo, Lobo, Batangas

Industrial Classification
Transport

Further details on the industrial classification
Lighthouses are essential maritime navigation infrastructure in the Philippines. Built in the late 19th century, they formed part of a nationwide network of lighthouses essential to the safe passage of commercial and military vessels during the Spanish colonial period. As fixed coastal aids to navigation, they ensured safer inter-island shipping routes and were critical to the functioning of the Manila–Acapulco Galleon Trade and later trans-Pacific commerce.

Brief description

The Spanish lighthouse network in the Philippines comprises nearly 60 lighthouses and minor lights spread across the Philippine archipelago's hazardous coastlines. The Faros Españoles de Ultramar references 24 major lighthouses. The ensemble of Spanish lighthouses has a consistent application of engineering standards, with structures typically consisting of a masonry or metal tower attached to a keeper's dwelling, built from local stone or brick, and powered initially by kerosene-fueled lamps with Fresnel lenses imported from France.

Among these, one has been declared a National Cultural Treasure for its intactness and historical value: the Cape Bojeador Lighthouse (Faro de Cabo Bojeador). Completed in 1892, it marks the northwesternmost point in Luzon, and is the highest-elevated original and active Spanish lighthouse in the country. It features an octagonal brick tower and a central courtyard with a viewing gallery overlooking Cape Bojeador.

Two lighthouses have also been recognised as National Historical Landmarks:

Completed in 1896 and found in Lobo, Batangas, Malabrigo Point Lighthouse overlooks the Verde Island Passage, a critical maritime route rich in biodiversity. Its brick masonry, ironwork, and original keeper's house survive largely intact, offering a scenic and well-preserved example of colonial maritime infrastructure.

Lastly, Cape Santiago Lighthouse is among the oldest surviving Spanish lighthouses, distinguished by its cylindrical red-brick tower and low-lying coastal setting. It served as a navigational aid for vessels rounding the southern entrance to Manila Bay and remains operational today.

Modernised and operated today by the Philippine Coast Guard, this Spanish colonial-era lighthouse infrastructure continues to form an essential navigation infrastructure system that remains crucial in sustaining the 21st century's transoceanic connectivity and global trade networks.

In relation to *the Twentieth- Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific



Figure 2: Cape Bojeador Lighthouse. Photograph by Luzviminda7641. Source: Wikimedia Commons. Public domain

Committee on 20th Century Heritage (ISC20C), these lighthouses employed state-of-the-art navigational science for their time, including imported Fresnel lenses, engineered illumination systems, and standardised construction technologies that reflect Theme 2: Accelerated Scientific and Technological Development. Strategically positioned along the Pacific maritime corridors and within critical inter-island routes, they facilitated the safe passage of commercial vessels engaged in global exchange, aligning with Theme 4: World Trade and Global Corporations. As an integrated coastal network designed to guide, regulate, and communicate across vast maritime distances, they also embody Theme 5: Transportation Systems and Mass Communications.

Period(s) of operation

Since the construction of the Spanish colonial lighthouses in the late 19th century, all of the lights have undergone automation, diminishing the need for lighthouse keepers and their supporting infrastructure; many such lighthouses have also been lost to earthquakes, typhoons, war, and time. The three described are outstanding in their completeness and continued operation.

Key events/chronology and changes to relevant attributes

1846- The Plan General de Alumbrado de Maritimo de las Costas del Archipelago de Filipino (Masterplan for the Lighting of the Maritime Coasts of the Philippine Archipelago) was commissioned with the goal of installing 55 lighthouses all over the archipelago.

1887- Spanish engineer Magin Pers y Pers designed the Cape Bojeador lighthouse, thereafter he proposed the construction of a lighthouse at Cape Santiago, Don Santiago Zobel funds the construction.

1890- The Cape Santiago lighthouse was lit.

1892- Cape Bojeador lighthouse was lit.

1896- Malabrigo Point Lighthouse, one of the last lighthouses in the project was li, completing the 30-year master plan.

1940s- Cape Santiago and Malabrigo Point lighthouses were damaged during World War II.

1990- Cape Bojeador's lenses were damaged by the Luzon earthquake taking it out of commission. It was repaired in the

1990s; Cape Santiago was restored and converted into an inn for tourism use.

2004- Cape Bojeador was declared a National Historical Landmark.

2005- Cape Bojeador was declared a National Cultural Treasure.

2006- Malabrigo Point Lighthouse was declared a National Historical Landmark.

2018- Cape Santiago Lighthouse was declared as a National Historical Landmark.

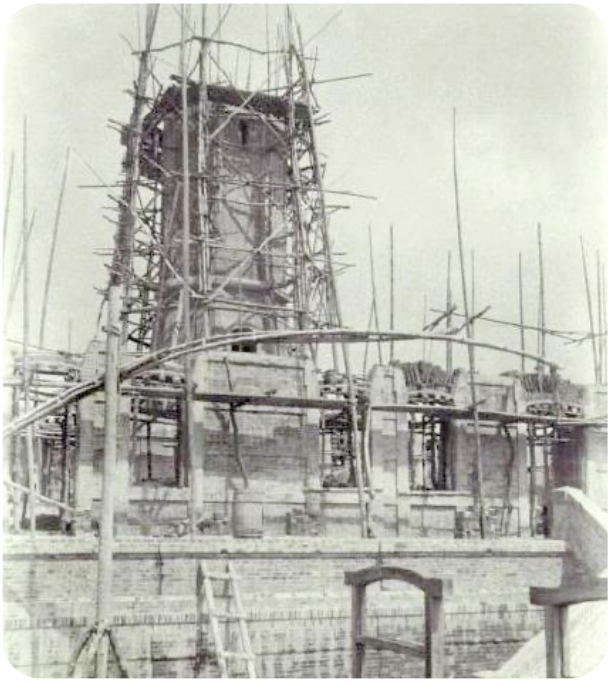


Figure 3: Cape Bojeador under construction, 1893. Source: Patrimonio Nacional, Spain, *Carpeta Islas Filipinas. Obras Publicas, Faros*. Wikimedia Commons. Public domain



Figure 4: Cape Santiago in 1903, Bureau of Insular Affairs. Source: War Department - Fourth Annual Report of the Philippine Commission, Wikimedia Commons. Public domain



Figure 5: Malabrigo Point Lighthouse. Photograph by Peter Ang. Source: Wikimedia Commons. CC BY-SA 3.0

Status of the research and historical documentation

Documentation on the Spanish colonial lighthouses of the Philippines is relatively extensive, with key references covering both individual structures and the system as a whole. Lonely Sentinels of the Sea by Manuel Maximo Noche (2005) is among the most comprehensive English-language resources on Philippine lighthouses, providing detailed architectural, historical, and photographic records of over two dozen sites. Another foundational text is *Faros Españoles de Ultramar*, which includes original Spanish-era plans, typologies, and construction details. Online, ibiblio.org hosts a searchable and annotated list of both Spanish and postcolonial lighthouses across the country, including operational data, photos, and maintenance updates. For the three National Cultural Treasures—Cape Bojeador, Malabrigo Point, and Cape Santiago—additional documentation is held by the National Museum of the Philippines and the National Historical Commission of the Philippines, including conservation reports, architectural drawings, and declarations of cultural significance.

Some historic plans, logbooks, and engineering records are believed to be stored in the Philippine Coast Guard archives and the *Archivo General de Indias* in Spain, though these are not yet digitized. Scattered municipal archives and heritage inventories contain supplementary information, including local oral histories.

Current status and state of conservation

The three featured lighthouses: Cape Bojeador, Cape Santiago, and Malabrigo Point are structurally complete and have undergone conservation and modernisation efforts.

While their original towers remain intact, newer lighting mechanisms have replaced historic lenses and equipment to meet current navigational needs. Each continues to function under the Philippine Coast Guard.

Conservation works by the National Museum and local governments have helped stabilize masonry, restore architectural elements, and improve limited visitor access. However, some ancillary structures have deteriorated or been altered, and periodic maintenance is still required due to exposure to coastal weather conditions.

Known threats
The Spanish-era lighthouses face multiple threats, including frequent typhoons, coastal erosion, rising sea levels, and seismic activity due to their exposed coastal locations. Earthquakes pose a structural risk to their ageing masonry towers, while climate change intensifies both wind and water damage. Saltwater corrosion also accelerates material deterioration.

Protection status
All three sites are listed on the Philippine Registry of Heritage and are protected.

Registration status in the national or local inventory
Cape Bojeador is a National Cultural Treasure (NCT), while Malabrigo Point and Cape Santiago are National Historical Landmarks (NHLs)

Ownership
The three lighthouses are managed by the Philippine Coast Guard, while heritage oversight and conservation responsibilities lie with the National Commission for Culture and the Arts

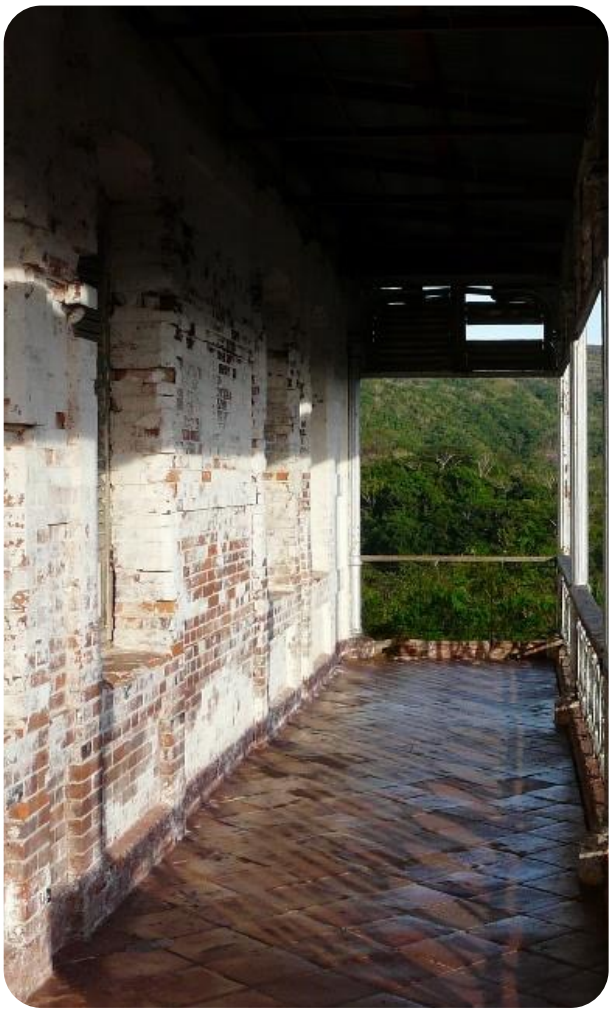


Figure 6: Detail of Cape Bojeador Keeper's Dwelling. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO



Figure 7: Cape Santiago. Photograph by Lawrence Ruiz (2018). CC-BY 4.0

Tutuban Station

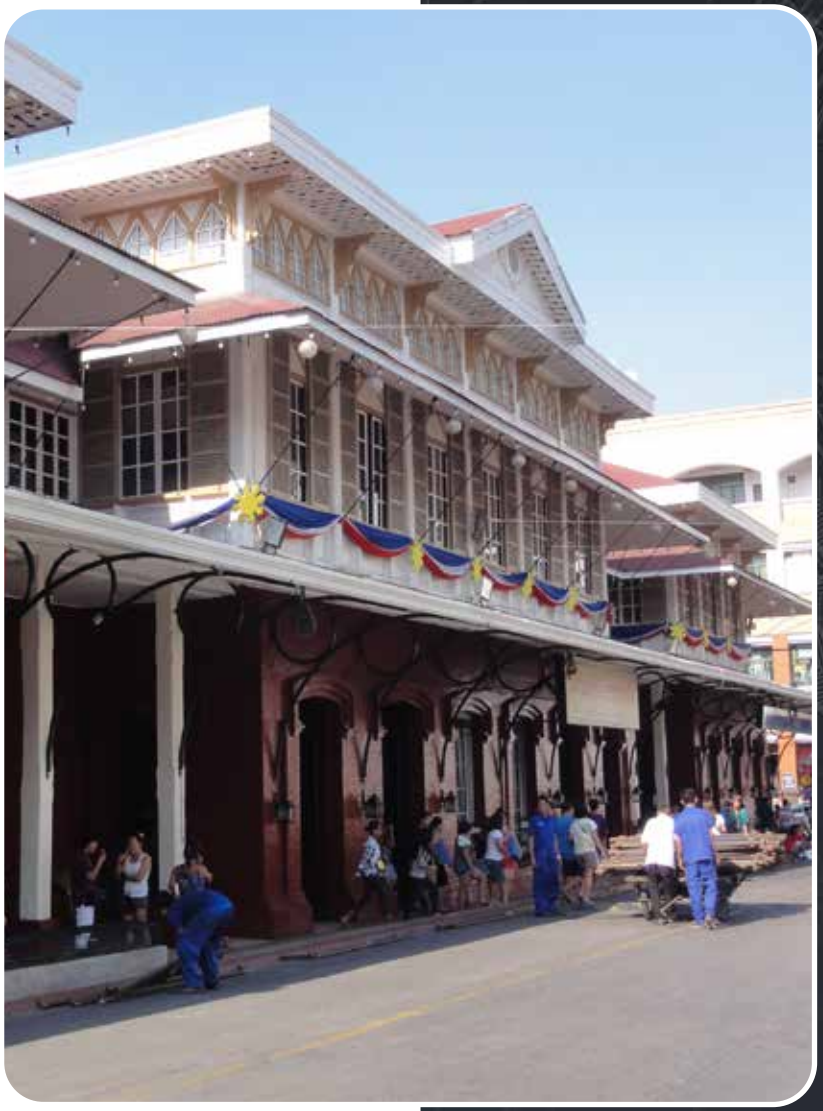


Figure 1: Facade of the old Tutuban Station in 2015. Photograph by Patrick Roque. CC BY-SA 3.0

Contributor:
Timothy Augustus Y. Ong
TICCIH Philippines

State, Province, Region
The Philippines
Cape Bojeador Lighthouse, Burgos, Ilocos Norte
Cape Santiago Lighthouse, Barangay Bagong Silang, Calatagan, Batangas
Malabrigo Point Lighthouse, Barangay Malabrigo, Lobo, Batangas

Industrial Classification
Infrastructure
Transport

Further details on the industrial classification
Tutuban Station served as the original central terminal of the *Ferrocarril de Manila-Dagupan*, the starting point of the country's main railway line during the Spanish colonial period.

Brief description

Tutuban Station, inaugurated in 1892, was the terminus of the *Ferrocarril de Manila-Dagupan,* the first railway line in the Philippines. Architecturally, it adapts British rail prescriptions with a brickwork base and a wooden upper level supported by riveted steel columns with acanthus capitals and other supporting elements rendered in metal. The structure is capped by a wide corrugated sheet iron roof, with exhaust vents and deep eaves suitable for the tropical climate. It also draws inspiration from the *bahay-na-bato* (stone house) typology in the Philippines, with the upper level features persiana sliding windows with media agua canopies, while panels of bandehado woodwork replace traditional ventanillas and espejo. A deep skirt roof surrounds the ground floor, providing shade around the structure for passengers and visitors.

Originally a passenger and freight railway terminal between Manila and northern Luzon, the station was pivotal in shaping the emergence of the Divisoria district as a main commercial hub within Metro Manila. While no longer serving as the main rail gateway, the station's adaptive reuse into the Tutuban Center has preserved its key architectural elements, with a conservation retrofit completed in 2017 by Ayala Land. A new PNR terminal is under construction nearby as part of the North–South Commuter Railway, temporarily halting rail service from 2024 to 2028.

The Manila-Dagupan Railway Network is the single largest infrastructure project in the Philippines by the Spanish colonial government. As Luzon's primary railway line, it was a showpiece of the technological ambitions of late Spanish rule and the integration of provincial economies into Manila's urban core. National hero José Rizal was known to have used the railway to organise and recruit intelligentsia from the provinces for the nationalist La Liga Filipina secret society. During the Philippine Revolution and later Philippine-American War, Tutuban and the Manila-Dagupan Railway were crucial for wartime logistics, with control of the rail line dictating troop movement, supplies and communications across Central Luzon. Filipino revolutionaries initially assumed control of the network, and when American forces later seized the railway, it became instrumental in consolidating colonial authority through rapid military deployment.

Heavily damaged during World War II, Tutuban Railway Station resumed operations under the Philippine National Railways, reestablishing its role as the country's primary rail terminal in Manila. However, national policy increasingly prioritized the development of the Pan-Philippine Highway which led to a decline in its route length and operational reach. With reduced capacity and declining ridership, Tutuban Station was eventually leased as part of a broader redevelopment scheme, retaining much of its historic fabric while being adapted into a commercial complex as Tutuban Center Mall in 1994.

In relation to *the Twentieth- Century Historic Thematic Framework* developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), the *Ferrocarril de Manila-Dagupan,* which served as the first railway line in the Philippines, represents Theme 5: Transportation Systems. The Tutuban Station's adaptation of British rail prescriptions with a brickwork base and a wooden upper level supported by riveted steel columns with acanthus capitals shows its connection to Theme 2: Accelerated Scientific and Technological Development Furthermore, the station's role in shaping Divisoria's emergence as a commercial hub in Manila represents Theme 1: Rapid Urbanization and Theme 4: World Trade and Global Corporations. Further, as a rail terminal damaged during WWII and eventually becoming a shopping mall, the developments of the



Figure 2: Manila & Dagupan Rail Road Station as depicted with a tramvia, foreground, on an early 20th-century postcard, No. 15. Manila & Dagupan Railroad, Island of Luzon, Philippines. Source: L.J. Lambert/ Lambert and Springer, 1907. Public domain.

building in relation to major historical events make it a cultural landmark in Manila, representing Theme 8: Popular Culture and Theme 10: War and its Aftermath.

Period(s) of operation

Tutuban Station began operations in 1892 as the terminus of the *Ferrocarril de Manila-Dagupan,* the first railway line in the Philippines. Initially operated under Spanish colonial administration, it continued service through the American period and into the postwar Republic era under the Philippine National Railways. For over a century, it functioned as the primary intercity rail hub for northern Luzon. By the late 20th century, long-distance operations declined, and the heritage building was repurposed by a private developer into a shopping mall, which opened in 1993 as the Tutuban Center. Despite this, the station remains active for commuter rail and features in the current national railway revival plan.

Key events/chronology and changes to relevant attributes

1875- Spanish Royal Decree issued for the preparation of a Luzon-based railway network.

1883- Don Eduardo Lopez Navarro's plan for the Ferrocarriles en la Isla de Luzón is approved by the crown.

1887- Concession for the Manila-Dagupan Line was awarded to Don Edmundo Sykes.

July 31, 1887- Cornerstone of the Tutuban Station was laid

November 24, 1892- the 195km long Manila-Dagupan Line enters service under the Manila Railroad Company Limited of London.

1896- The Katipunan Revolutionary forces under Andres Bonifacio took control of the railway.

1899-1900- The Philippine-American War saw both factions making use of the railway to transport troops through the Luzon campaigns.

1900- American Occupation forces and the American colonial government took control of the *Ferrocaril de Manila-Dagupan.*

1917- The service was renamed the Manila Railroad Company and by this point, it has expanded to over 1,140 km of track.

1934- The Historical Research and Markers Committee recognised the heritage value of the Tutuban Station, installing a marker on its façade.

1942-1945- The Japanese Imperial forces occupied the Philippines during World War II; the resulting battles resulted in over half of the network's destruction.

1956- The Manila Railroad Company was renamed as the Philippine National Railways, and continued to expand into the 1970s.

1970s- The Pan-Philippine Highway took precedence over the PNR leading to a reduced operating budget.

1988- 22 hectares of land in Tutuban including the historic railway station were leased out to private entities for redevelopment.

1994- the Tutuban Center Mall opened to the public under Tutuban Properties, Inc.

2016- Tutuban Properties, Inc. was acquired by Ayala Land and underwent architectural and structural retrofitting.

2017- Conservation retrofit on the Tutuban Station was completed and the mall reopened to the public.

2024- PNR halted all operations in Metro Manila, including the Manila-Dagupan line for five years as the North-South Commuter Railway project commenced.

Status of the research and historical documentation

Research on Tutuban Station is closely tied to broader studies of Philippine railway history, most notably Dr. Arturo Corpuz's The Colonial Iron Horse: Railroads and Regional Development in the Philippines, 1875–1935, which offers critical insight into the socio-economic context of the Manila–Dagupan rail line and the institutional development of the railway system.



Figure 3: Detail of decorative ironwork on interior column; background- adaptive re-use as Tutuban Center foodcourt. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

There is no comprehensive architectural monograph on Tutuban Station. Most available information comes from public-facing sources, such as the Philippine National Railways website, or external media articles, as well as heritage and travel blogs.

Photographs are available from the National Archives of the Philippines, the Lopez Museum, and the John Tewell Archive. U.S.-based archives include the Harry S. Truman Library, and the HathiTrust Digital Library. The Library of Congress conserves the photo collection: Ferro carril de Manila a Dagupan for on-site consultation only.

There are still gaps in architectural documentation, conservation management planning, and contextual studies linking Tutuban to the urban morphology of Manila, with a specific focus on industrial heritage.

Current status and state of conservation
The 1892 station has been adaptively re-used and integrated into the Tutuban Center mall. Most of the built fabric, including the iron trusses, arches and brickworks, remain intact, as are portions of the original railway preserved in the surrounding plaza. Under the Ayala-led redevelopment in 2016-2017, a structural and architectural retrofit to the historic façade was conducted. The original colour palette was restored and monumental lighting installed to highlight architectural details. The building no longer serves as an active railway hub but is still adjacent to PNR tracks and a newer terminal supporting rail services. However, ongoing railway projects in and around Manila may impact both its future function and the extent of the existing site still dedicated to rail use.

Known threats
Tutuban Station faces threats from urban encroachment, redevelopment pressures, and the climate crisis, including flooding and severe storms due to its proximity to Manila Bay. Ongoing PNR infrastructure projects may alter surrounding rail facilities, impacting the site's spatial and functional context. Rising land values in Divisoria create pressure for high-rise development, which may compromise visual integrity and setting. Although marked as a historical site since 1934, it needs stronger legal classifications, which would ensure more stringent conservation measures.

Protection status
The station is protected as a Heritage Structure under the National Cultural Heritage Act of 2009

Registration status in the national or local inventory
Tutuban Railway Station is on the Philippine Registry of Heritage as a Marked Structure by the NHCP, with a marker unveiled in 1934.

Ownership
Tutuban Station is under the ownership of the Philippine National Railways for its rail-related functions, while portions of the historic station building and surrounding property are currently leased and managed by Ayala Land Logistics Holdings Corp., which operates the Tutuban Center as a commercial development.



Figure 4: Tutuban Station Today. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

References:

Bautista, K. (2018) 'Tutuban Station Transformed From Rail to Retail', BluPrint – One Mega, 24 April. [online] Available at: https://bluprint-onemega.com/architecture/commercial/tutuban-station-retrofit-ayala/ (Accessed: 4 August 2025).

Corpuz, A.G. (1999) The Colonial Iron Horse: Railroads and Regional Development in the Philippines, 1875–1935. Quezon City: University of the Philippines Press. ISBN 9715422209.

Damian, J., Mabazza, D. (2018) Tracing the History of the Philippine National Railways: Historical Geographic Visualization of the Ferro-Carriles en Isla de Luzon (1891–1945). Philippine Transportation Journal, 1(1), pp. 14–. [online]

Quezon City: National Center for Transportation Studies, University of the Philippines Diliman. Available at: https://www.ncts.upd.edu.ph/tssp/wp-content/uploads/2018/08/Damian18.pdf (Accessed: 4 August 2025).

Gonzalez, M.M. (1979) 'The De Manila a Dagupan', Asian Studies, 17, pp. 18–36. [online] University of the Philippines Diliman. Available at: https://asj.upd.edu.ph/mediabox/archive/ASJ-17-1979/gonzalez-manila-dagupan.pdf (Accessed: 4 August 2025).

Marsden, S. and Spearritt, P. (2021) The Twentieth-Century Historic Thematic Framework: A Tool for Assessing Heritage Places. Los Angeles: Getty Conservation Institute

Paredes-Santillan, C. ., Manalo, M. F. . and Pinlac, J. C. M. . (2025) "By Rail and Mail: Understanding the Significance of Colonial Architecture for Mass Transport and Communication in The Philippines", MAJ - Malaysia Architectural Journal, 7(6), pp. 199–216. Available at: https://www.majournal.my/index.php/maj/article/view/292 (Accessed: 4 August 2025).

Philippine National Railways (n.d.) PNR in Philippine History. [online] Manila: Philippine National Railways. Available at: https://pnr.gov.ph/about-contact-us/who-we-are/pnr-in-philippine-history/pnr-in-philippine-history.html (Accessed: 4 August 2025).

University of the Philippines Los Baños



Figure 1: UPLB's Main Library in the brutalist style. Foreground - The Pegaraw (Pegasus-Tamaraw) by National Artist Napoleon Abueva and the mascot of the campus. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO

Contributors:
Timothy Augustus Y. Ong
TICCIH Philippines

Eugene Raymond P. Crudo
Department of Social Sciences, College of Arts and Sciences, University of the Philippines Los Baños

State, Province, Region
The Philippines
Laguna, Philippines

Industrial Classification
Agricultural & Fishing
Food & Drink Processing
Forest Industries
Industrial Communities
Research and Educational Facilities

Further details on the industrial classification
The University of the Philippines Los Baños integrates agricultural production, food and drink processing, forestry, and education within one institutional complex. Since its founding in 1909, the campus has combined experimental farms, dairy and crop-processing facilities, and forestry stations with residential and communal spaces, and a train station, forming an industrial community for students, faculty, and workers. It serves as South-East Asia's earliest and one of the leading research and training centres in agriculture and forestry.

Brief description

The University of the Philippines Los Baños (UPLB), established in 1909 as the University of the Philippines (UP) College of Agriculture, is a pioneering educational and research institution that integrates agriculture, forestry, food processing, and community life within a single campus at the foot of Mount Makiling Forest Reserve(MMFR) in Laguna (ASEAN Heritage Park). The site is composed of academic halls, laboratories, experimental farms, research stations, and residential facilities built primarily from the 1940s to the 1970s, encompassing many architectural styles, including American colonial, Neoclassical, International Style, and Brutalism. Notable structures include Baker Hall, Student Union Building, DL Umali Hall, the Dairy Training and Research Institute and the Institute of Animal Science, the UPLB University Library, and the Forestry complex.

The tangible attributes of the campus encompass production-oriented facilities such as dairies and crop-processing plants, alongside campus infrastructure such as student dormitories, faculty housing, and social buildings like the Student Union. These elements establish UPLB as a site of industrial-scale agriculture and forestry and an academic-residential-research community. Its proximity to the Makiling Forest Reserve integrates environmental stewardship into its built landscape.

Intangible attributes of UPLB include its longstanding role in agricultural innovation, from experimental crop breeding and dairy production to forestry management and food processing technologies. The campus has nurtured generations of Filipino and international scientists, farmers, and foresters, contributing to skills, traditions, and practices that shaped rural development in South-East Asia.

In relation to *the Twentieth-Century Historic Thematic* Framework developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), the University of the Philippines Los Baños is at the intersection of scientific innovation, state formation, and environmental stewardship. Its experimental farms, dairy facilities, crop-processing plants, and forestry research stations reflect Theme 2: Accelerated Scientific and Technological Development, as the campus institutionalised advances in animal husbandry, plant breeding, food processing, and agricultural engineering. Through systematic experimentation on rice, fruit varieties, and livestock, UPLB became a centre for applied science that improved Philippine and Southeast Asian agricultural productivity. Under Theme 6: Internationalisation, New Nation-States, and Human Rights, UPLB functioned as a state-supported institution central to national development following independence. It expanded access to formal training in agriculture, forestry, and related sciences, professionalizing fields that had previously been based largely on informal or inherited practices, and through international and regional collaborations and programmes contributed to the circulation of scientific expertise across Asia. Its custodianship of the ASEAN Heritage Park and Forest Reserve of Mount Makiling, and its formalization of forestry science and environmental management programmes within this reserve corresponds to Theme 7: Conserving the Natural Environment, Buildings, and Landscapes. As a comprehensive academic campus dedicated to research and instruction, UPLB exemplifies Theme 9: Religious, Educational, and Cultural Institutions, demonstrating how the twentieth century institutionalised agricultural science, environmental stewardship, and higher education within a unified academic-residential community.

Period(s) of operation
The University of the Philippines Los Baños was founded in 1909 as the UP College of Agriculture, becoming the country's first higher-education institution dedicated to agricultural sciences. It expanded steadily through the American colonial era, survived the destruction of World War II, and was rebuilt beginning in 1945. Renamed as UPLB in 1972, it has since focused on agriculture, forestry, and food science education. Today, it remains in continuous operation as a national and regional hub for research, training, and agro-industrial development.

Key events/chronology and changes to relevant attributes
1909 – UP College of Agriculture founded under American rule; experimental farms and forestry research initiated.

1910s–1930s – Expansion of teaching and research; first campus facilities built; extension services for local farming communities

1941–1945 – World War II occupation; Baker Hall used as an internment camp; campus infrastructure heavily damaged.

1945 – Postwar reconstruction; restoration of Baker Hall and construction of new academic buildings such as Mendiola Hall.

1960s – Establishment of the Dairy Training and Research Institute (DTRI), Museum of Natural History, and forestry laboratories.

1972 – Elevation to University of the Philippines Los Baños (UPLB); expansion into human ecology, development communication, and environmental science.

2000s–present – Modernization of laboratories and classrooms; Baker Hall and other mid-century structures identified for heritage conservation.



Figure 2: Detail of the UPLB Main Library. Photograph by Timothy Augustus Ong. CC-BY-SA 3.0 IGO



Figure 3: Baker Hall is the oldest building of the College of Arts and Sciences and one of the oldest on campus (1927-1938) it was used as an internment camp for Allied Forces prisoners of war by the Japanese, and survived the battle for the liberation of the Los Baños Campus. Photograph by Eugene Crudo. CC-BY-SA 3.0 IGO

Status of the research and historical documentation
Research and historical documentation of the UPLB began with its founding as the UP College of Agriculture in 1909, when early records included agricultural experiment reports, crop trials, and administrative documents.

Published histories cover its American colonial origins, its wartime role, and postwar reconstruction. Baker Hall, used as an internment camp during the Japanese occupation, has been the focus of published works in Philippine wartime history. The UPLB Museum of Natural History, established in 1976, maintains extensive biological collections and archives supporting biodiversity research. Major research continues through academic programmes in agriculture, forestry, and development studies, often linked with international partners such as the nearby IRRI and SEARCA.

Identified gaps include detailed architectural surveys of postwar buildings, oral histories of campus communities, and conservation studies of mid-20th-century facilities.



Figure 4: The Carillon Tower by Leandro Locsin was built in 1996 to commemorate the centenary of National Hero Jose Rizal's death and is the tallest building on campus. Photograph by Eugene Crudo. CC-BY-SA 3.0 IGO

Current status and state of conservation
UPLB remains an active university campus with most of its academic, residential, and research buildings in continuous use.

Structures from the 1940s to the 1970s, including Baker Hall, Mendiola Hall, and forestry facilities, survive but show varying degrees of wear, with some requiring conservation attention.

Functional units such as the Dairy Training and Research Institute and experimental farms continue operating, preserving aspects of original agro-industrial equipment and practice.

Known threats
UPLB faces pressures related to modernisation needs, including replacement or alteration of mid-20th-century academic buildings and residential facilities. Several heritage structures, such as Baker Hall, show signs of deterioration due to age and limited conservation funding. Urban expansion in Laguna and increased student population also strain campus infrastructure. The site is also vulnerable to natural hazards, including typhoons, flooding, and seismic risk, which pose additional threats to both historic and functional facilities.

Protection status
The UPLB campus is protected as part of the University of the Philippines System, a national government institution. While no buildings are formally declared as national cultural properties, Baker Hall and other historic structures are safeguarded by university stewardship, campus planning controls, and local heritage advocacy measures.

Registration status in the national or local inventory

UPLB has been listed in the Philippine Registry of Heritage as a declared heritage site and is a Registered Property of the Municipality of Los Baños, Laguna. Several structures within the campus, such as Baker Hall, are recognised locally for their historical significance, works by National Artists such as the Carillon by Leandro Locsin are also on the registry, with heritage nomination initiatives for further structures under discussion at the university and municipal levels.

Ownership

The University of the Philippines Los Baños is publicly owned and administered as a constituent unit of the University of the Philippines System, a national university funded and overseen by the Philippine government through the UP Board of Regents. All campus lands, buildings, and facilities remain under state ownership.



Figure 5: The Brutalist D. L. Umali Hall by National Artist Leandro Locsin is the main auditorium of the campus (1965). Photograph by Eugene Crudo. CC-BY-SA 3.0 IGO



Figure 6: Institute of Animal Science, formerly the pre-war Animal Husbandry Building (1921). Photograph by Eugene Crudo. CC-BY-SA 3.0 IGO

Victorias Milling Company (VMC)



Figure 1: Exterior facade of the modernist Saint Joseph the Worker Parish Church by Czech architect Antonin Raymond. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

Contributors:
Pauline Basilia
Interdisciplinary Studies, Institute of Arts and Sciences, Far Eastern University, Manila
Professorial Lecturer, School of Archaeology, University of the Philippines Diliman

Timothy Augustus Y. Ong
TICCIH Philippines

Ivan Anthony S. Henares
Asian Institute of Tourism, University of the Philippines, Diliman

State, Province, Region
The Philippines
Victorias City,
Negros Occidental

International designations
The site is part of the Philippine Tentative List for UNESCO World Heritage under *The Sugar Cultural Landscape of Negros and Panay Islands.*

Industrial Classification
Agricultural & Fishing
Food & Drink Processing
Industrial Communities

Further details on the industrial classification

Sugar production in the Philippines developed into an industrial-scale enterprise under Spanish and American colonial influence, with Negros Island as its epicentre. The establishment of sugar centrals such as Victorias Milling Company (VMC) in 1919 introduced mechanized milling, steam power, and centralised processing of cane from multiple haciendas. This marked the country's transition to agro-industrial modernity despite the absence of a full Industrial Revolution. VMC exemplifies this classification as a functioning industrial community, complete with milling facilities, worker housing, transport links, and social infrastructure, while remaining the country's largest and most iconic sugar producer.

Brief description

Victorias Milling Company, established in 1919, is one of the most important sugar centrals in the Philippines and remains the largest producer of refined sugar in the country. The complex covers over 7,000 hectares in Victorias City, Negros Occidental, encompassing industrial, residential, and religious structures that collectively illustrate the landscape of a company town shaped by the sugar industry.

The mill complex is anchored by the tandem mills 'A' and 'C', monumental industrial facilities that introduced mechanised milling at a scale previously unseen in the Philippines. Their establishment reflected the transition from small-scale hacienda mills to centralised agro-industrial production, a system that defined the region's economy and society throughout the 20th century.

Beyond its industrial core, VMC is notable for its planned community fabric. The compound contains preserved wooden residences once occupied by mill executives and employees, reflecting the hierarchy embedded in plantation life. The site also integrates social and cultural infrastructure, most prominently the Saint Joseph the Worker Parish Church, an Important Cultural Property. Completed in the mid-20th century, the church is distinguished as an early architectural masterpiece by Antonin Raymond and by Alfonso Ossorio's striking mural of the 'Angry Christ', which has become a landmark of modern Philippine art and a cultural emblem of the Negros sugar industry.

In relation to the Twentieth-Century Historic Thematic Framework developed by the Getty Conservation Institute and the ICOMOS International Scientific Committee on 20th Century Heritage (ISC20C), the Victorias Milling Company's large-scale central milling operations and technological upgrades in sugar production reflect Theme 2: Accelerated Scientific and Technological Development and Theme 3: Mechanized and Industrialised Agriculture, in its aggregation and shift from hacienda-based milling to centralise refinery systems integrating cane fields, and processing plants in an agro-industrual chain. This vertically organised system positioned Negros as a major contributor to Philippine sugar exports, aligning with Theme 4: World Trade and Global Corporations, where commodity production linked provincial plantations to global markets. The commissioning of the Saint Joseph the Worker Parish Church by Antonin Raymond and the mural of the 'Angry Christ' by Alfonso Ossorio demonstrates Theme 6: Internationalisation and the Emergence of New Nation-States, where transnational artistic collaboration intersected with the wealth generated by agro-industrial capitalism of these sugar barons.

Period(s) of operation
Victorias Milling Company was founded on 7 May 1919 by Don Miguel J. Ossorio during the American colonial period. Conceived as one of the country's pioneering sugar centrals, it introduced mechanized, centralized milling that transformed production in Negros Occidental. Despite the upheavals of war, post-independence reforms, and the sugar crises of the late 20th century, VMC has remained in continuous operation. Today, more than a century since its establishment, it continues to function as the largest producer of refined sugar in the Philippines.

Key events/chronology and changes to relevant attributes
Constructed during the American colonial period, the Victorias Milling Company emerged as part of a broader effort to improve on and reorganise the earlier sugar system established by Nicolas Loney. It is an instance of the American push toward centralised production, a transformation that restructured and undermined existing socio-economic patterns, most notably through the alteration of waterways to accommodate large barges and the establishment of the factory system in Guimaras. We support the promotion of the site as a culturally significant industrial heritage to give Filipino researchers time to decolonise its history.

7 May 1919: Founding of Victorias Milling Company by Don Miguel J. Ossorio, marking a decisive turn to mechanized, centralised sugar production in Negros Occidental.

1919–1930s: Construction of tandem mills 'A' and 'C', barge systems to transport cane, and residential enclaves for executives and workers. These reflected American colonial policies of industrial concentration and company-town planning.

1940s–1960s: Expansion of production capacity and consolidation of the company town.



Figure 2: Alfonso Ossorio's Angry Christ mural within the Saint Joseph the Worker Parish Church. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO



Figure 3: Entrance to the VMC Complex. Photograph by Ivan Anthony S. Henares. CC-BY-SA 3.0 IGO

1950: Notable cultural additions include the Saint Joseph the Worker Parish Church by Antonin Raymond and Alfonso Ossorio's 'Angry Christ' mural.

1970s–1980s: National sugar crises under Marcos-era Philsucom and NASUTRA policies led to economic downturns, but VMC remained a key player despite industry-wide collapse.

1990s–2000s: Restructuring and modernisation efforts allowed VMC to survive amid liberalization and global competition.

Status of the research and historical documentation
Archaeological excavation has yet to be conducted on the site. As it is on the 'The Sugar Cultural Landscape of Negros and Panay Islands' entry to the Philippines' Tentative List for World Heritage nomination, the related dossier collates most available information on the site. TICCIH Philippines likewise maintains an accessible report on its website. The sugar industry of the Philippines has been the subject of several publications that discuss VMC as a forerunner in this industry.

Current status and state of conservation
The site is in use but in private hands limiting access to the structures; further investigation is required. Colonial-era wooden residences, executive housing, and worker accommodations are preserved but are showing signs of ageing. Cultural landmarks such as the Saint Joseph the Worker Parish Church and Alfonso Ossorio's 'Angry Christ' mural are well-maintained.

Known threats
Since the site is privately owned, locals fear that the owners could decide to tear down heritage structures, which has happened in other areas of the Philippines.

Market forces that determine the profitability of sugar and, in turn, the feasibility of operating sugar mills will be the primary factor that may lead to its disuse or closure.

Protection status
Victorias Milling Company forms part of *The Sugar Cultural Landscape of Negros and Panay Islands* which is included in the Philippine Tentative List for UNESCO World Heritage. While no specific national designation currently protects the mill complex, individual elements such as the Saint Joseph the Worker Parish Church are recognised and maintained as cultural landmarks.

Registration status in the national or local inventory
It is registered in the Talapamana ng Pilipinas, the Philippine registry of heritage.

Ownership
The site is owned by the Victorias Milling Company.



Singapore

Contributors:

Ho Weng Hin
Studio Lapis
Co-Founder, Principal Conservation
Specialist Consultant
Docomomo Singapore, Founding Chair

Adrian Han
Studio Lapis
Conservation Consultant

Jaclyn Chua Xinhua
Studio Lapis
Conservation Specialist Consultant

Engines of Change: The Making of Industrial Singapore

Singapore's path to industrialisation was neither straightforward nor inevitable. Founded as a free port in 1819, it first grew as an entrepôt economy, its fortunes tied to global trade and the labour of diverse migrant communities. Yet over the course of the nineteenth and twentieth centuries, the island was remade by successive experiments in agriculture, infrastructure, and planning. Plantations of gambier, pepper, and rubber gave way to belts of estates and canneries; colonial railways and docks bound hinterlands to the port; post-war housing and industrial estates redefined the relationship between work and community.

By independence, industrialisation had become a state project, embodied most dramatically in Jurong, but also distributed across neighbourhood estates and sustained by the infrastructural backbone of power stations. This essay traces that transformation from riverine trade to planned industrial towns and show how Singapore's industrial landscapes emerged from the interaction of global capital, local enterprise, and state planning.

Entrepôt Economy and Riverine Societies

Singapore's industrial narrative began with trade. The British East India Company established Singapore as a free port in 1827, primarily as a transhipment point along the route from India to China. From the outset it operated as a mercantile hub, drawing in a wide mix of communities. Chinese merchants dominated the lucrative opium trade; Bugis seafarers dealt in textiles and spices; Europeans acted as agents of industrial capital; Chulia moneylenders, Arab merchants and others added to the cosmopolitan mix that defined the port.



Figure 1: Rubber tapping in Singapore, late 19th Century

This economy took shape along the Singapore River, the main artery for ships and goods. The south bank was the preserve of Chinese merchants, where the 'back-of-house' labour of trade was carried out in godowns and warehouses. The north bank, in contrast, was lined with European firms, Chulia shop-houses, and civic institutions, with Merchant Square as its commercial anchor. Beyond the Singapore river, the Rochor River hosted Bugis settlements, allotted to sea-traders from Makassar. Together, these clusters formed the bustling nexus of commerce that bound Singapore into regional and global circuits, and established the colony's first town centre, where trade and small-scale industry converged along the riverbanks.

The architecture of trade reinforced this pattern. Shophouses, introduced under Raffles' 1822 town plan, were highly flexible units: shopfronts at street level with upper floors adaptable for residence or storage. They enabled both commerce and living within the colonial town. By the 1840s, however, the sheer growth of shipping demanded more specialised facilities, and dedicated *godowns* (one-storey, gable-roofed storage houses), multiplied along the river, particularly along Boat Quay, built by merchants such as Tan Kim Seng. Yet the reliance on volatile commodities such as opium and tea soon exposed the fragility of this system. The slump of the 1830s marked by falling opium prices and the end of the East India Company's tea monopoly prompted merchants to seek more stable ventures beyond the town, laying the groundwork for the plantation era.

Cash Crops and the Roots of Industrialisation

By the 1830s, falling opium prices and the end of the East India Company's tea monopoly pushed merchants to diversify into plantation crops. Europeans experimented with nutmeg near town, while Chinese planters turned to gambier and pepper to meet Britain's demand for tanning and dyeing. These plantations clustered in the forested north, where firewood was essential for processing gambier leaves. Yet shifting cultivation quickly exhausted soils, and nutmeg was eventually destroyed by disease, paving the way for more profitable ventures.



Figure 2: Queen Mary in graving dock, August 1940

By the late 19th century, rubber and pineapples had overtaken older gambier and pepper estates. Rubber surged with the rise of the automobile industry, while pineapples, planted between young rubber trees, supported a thriving canning trade by the 1920s. The industry was kickstarted by Henry Ridley, the first director of the Singapore Botanic Gardens, who used the gardens as a testbed for cultivation and extraction techniques in the late 1800s. Local entrepreneurs soon followed. Tan Kah Kee, Lee Kong Chian, and Lim Nee Soon established vast plantations and built diversified empires spanning smokehouses, factories, and canneries. Tan Kah Kee, remembered as the 'Henry Ford of Asia', epitomised this industrial drive, expanding from estates into pineapple canneries and rubber, shoe, and tyre factories across Sembawang and the Rochor River.

British investors soon entered on a larger scale. Through companies such as the Bukit Sembawang Rubber Company and Singapore United Rubber Plantations Ltd., they consolidated more than 12,000 acres in the north by 1912, stretching from Changi to Sembawang. These estates and

their networks of processing plants turned the countryside into belts of industrialised agriculture, laying the foundations for the factories and warehouses that followed (Figure 1).

A few notable examples show how rubber sustained a host of side industries and industrial chains:

The Former Ford Factory, opened in 1926 and designed in the Art Deco style by French engineer-architect Emile Brizay, was strategically located to serve both supply and demand of the automobile industry. On one hand, it sat close to Malayan plantations that fed tyres into the production line; on the other, it tapped into a growing regional market for automobiles.

The Lee Rubber godown at Rochor River, rebuilt in the late 1950s by Kumpulan Akitek after a devastating fire, anchored Singapore's role as processor and distributor. Smoked sheets and latex arrived by rail or coastal craft, were milled and graded here, then warehoused before export. Architecturally, its fair-faced brick façades, repetitive loading bays, and distinctive octagonal ventilator stacks reflected robust industrial modernism.



Figure 3: Tanjong Pagar Harbour, c.1910



Figure 4: Tangjong Pagar Railway Station in 2017 Opened in 1932 and designed by Serbian architect D. S. Petrovitch of architectural firm Swan & Maclaren. The statues on the façade are attributed to Angelo Vannetti. Situated on Keppel Road, it was gazetted as a national monument in 2011

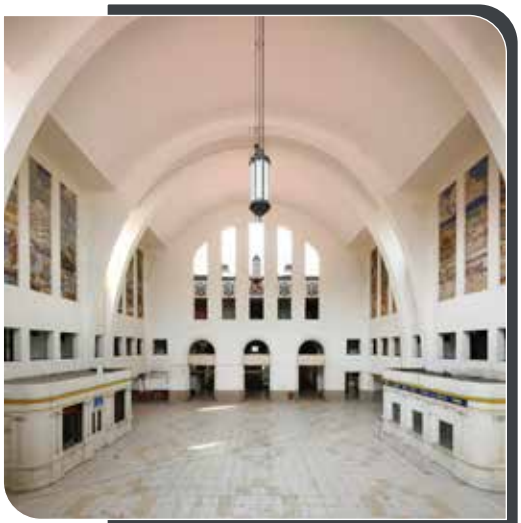


Figure 5: Interior of Tangjong Pagar Railway Station in 2014

Rubber also sustained smaller, village-based industries. Pottery kilns produced the clay vessels tied to trees to catch latex during tapping, a modest but essential part of daily production. The Thow Kwang Dragon Kiln, built in 1944, was operated by Teochew and Hokkien families. Kilns like this anchored village landscapes in Jurong's clay-rich valleys, tying local livelihoods to the wider plantation economy.

However, by the post-war years, most of these cash crop economies were in decline, displaced by the sudden urban growth that characterised the post-war era and by shifting markets. A brief exception was tobacco, cultivated under colonial incentives from 1948 and processed by the Tong Nam Tobacco Co. (1956) into familiar local cigarette brands. Yet by the 1970s, with farmland shrinking, global competition, and anti-smoking policies, this too faded away. Its rise and fall marked the final chapter of Singapore's agricultural cash crop era.





Figure 6a and 6b: Tangjong Pagar Railway Station in 2017 Opened in 1932 and designed by Serbian architect D. S. Petrovitch of architectural firm Swan & Maclaren. The statues on the façade are attributed to Angelo Vannetti. Situated on Keppel Road, it was gazetted as a national monument in 2011

Colonial Infrastructural Networks

From the late 19th century, however, colonial infrastructure projects went beyond serving the town. British expansion into Malaya, spurred by tin in Perak and Selangor and vast hinterland resources, created an integrated logistical backbone across the peninsula. Malaya supplied what Singapore lacked including land, forests, tin, and rubber while Singapore functioned as the administrative and export centre.

To channel these resources, the British invested heavily in railways, roads, and docks (Figure 2). The Federated Malay States Railway (FMSR) carried tin and rubber southwards into Singapore's docks. With steamships

requiring deeper berths, the port shifted from the Singapore River (Figure 3) to Keppel Bay, where reclamation created the Empire Dockyard. At its heart stood Tanjong Pagar Railway Station (Figures 4, 5 and 6), both terminus and monument of imperial ambition. In the 1930s it even hosted industrial exhibitions, with Singapore Rubber Works proudly displaying its products.

The 1930s also brought aviation into the network with the opening of Kallang Airport, complete with modern hangars. More than a symbol of colonial prestige, civil aviation added new capacities for mail, cargo, and business travel, complementing the established flows of rail and shipping.

The railway itself was deliberately aligned to serve industrial sites, with sidings linking directly to Sembawang's rubber estates and smaller industrial nodes across the island. The Bukit Timah quarries, owned by Chinese entrepreneurs, supplied stone for public buildings before leaving behind quarry ponds that reshaped the landscape. The Alexandra Brickworks, founded in 1899, pioneered mass brick production, supplying projects from Gilman Barracks to the National Library. Strung together by colonial infrastructure, these industries were folded into the logistical spine of the FMSR and the Empire Dockyard.

The system endured beyond the colonial era. After the war, the same transport links continued to shape development, with estates such as Alexandra Industrial Estate emerging naturally along established railway and port corridors.



Figure 7: Cooling Systems and Flexibles, 1971. Photograph by Jeremy San. Source: Docomomo Singapore. CC-BY-SA 3.0 IGO

From Experiments to a Holistic State Strategy

The Second World War plunged Singapore into economic stagnation. When the British returned, they briefly shifted from laissez-faire governance to state welfare, experimenting with public housing through the Singapore Improvement Trust (SIT). Yet rapid migration and a post-war baby boom soon overwhelmed these measures. By the late 1950s, overcrowding and rising unemployment were acute, with official jobless figures at 14% in 1959; though the real number was likely higher. The situation grew more dire in the years ahead: separation from Malaysia in 1965, Indonesia's Konfrontasi, and the withdrawal of British forces in 1968 further destabilised an already fragile economy.

For the newly elected PAP government, survival depended on tackling both housing and jobs. One of the first moves of the new self-governing PAP administration was the *Pioneer Industries Ordinance* (1959), designed to reduce unemployment by supporting local manufacturing. A landmark outcome was the Prima Flour Mill (1963–64), Singapore's first and largest flour mill, whose concrete silos along Keppel Harbour acted as an early symbol of economic recovery.

The Housing and Development Board (HDB), created in 1960 to replace SIT, dramatically accelerated rehousing and slum clearance. Yet housing and these early local industries could not, on their own, absorb the sheer scale of surplus labour. By the early 1960s it became clear that Singapore would need a more comprehensive strategy.

In 1961, a United Nations mission led by Dutch economist Albert Winsemius proposed a comprehensive industrialisation programme, which became the blueprint for Singapore's economic strategy. His 1963 report, A Proposed Industrialisation Programme for the State of Singapore, outlined both immediate measures via light, labour-intensive industries to absorb surplus workers; and longer-term goals to grow capital-intensive sectors. It directly informed the creation of the Economic Development Board (EDB) and underpinned landmark initiatives such as Jurong Industrial Estate, alongside policies that opened Singapore to foreign investment and laid the foundations for sustained industrial growth. The Economic Expansion Incentives Act (1967) later offered tax exemptions and benefits to multinational corporations, cementing foreign direct investment (FDI) as the core of Singapore's industrial strategy.

In this reframing, people themselves became the key economic resource. Housing stabilised them as citizens, while industry mobilised them as workers. The state now wielded planning not merely to shelter a population, but to transform surplus labour into productive human capital at the heart of nation-building.

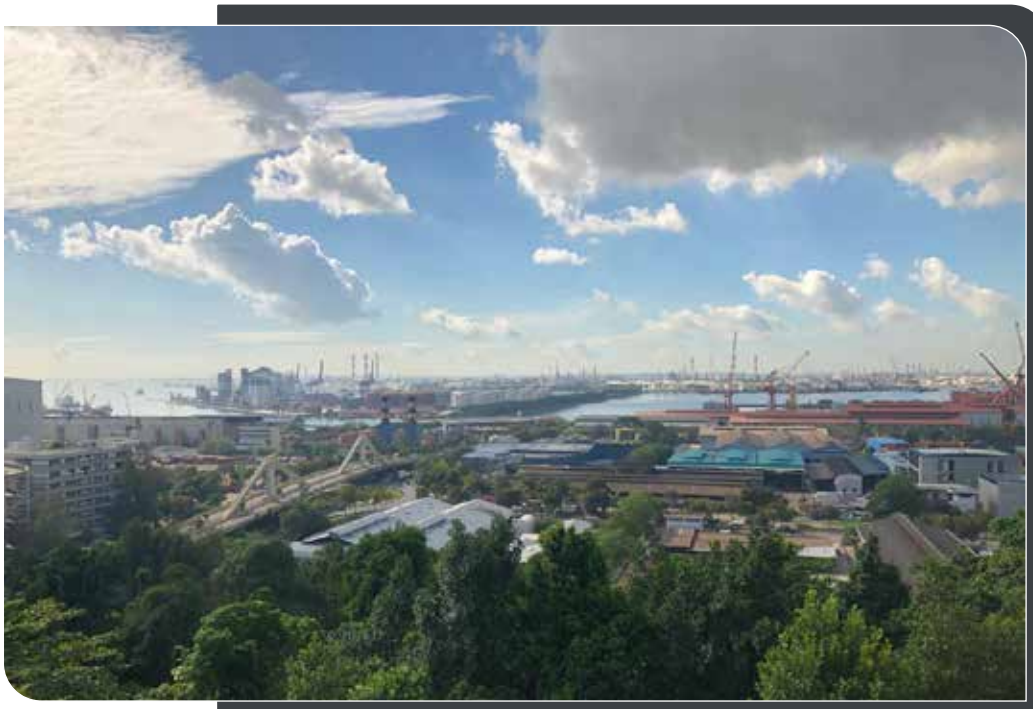


Figure 8: Jurong Island viewed from the top or Jurong Hill Tower, showing port and shipyard facilities

Jurong: Flagship of Industrial Singapore

The boldest expression of Singapore's post-independence strategy to build industrial landscapes that served both industry and people, was the Jurong Industrial Estate. Spearheaded by Finance Minister Goh Keng Swee and guided by UN advisor Albert Winsemius, it was carved out of swampland in the early 1960s as the flagship project of the Economic Development Board (EDB). Jurong embodied the decisive shift from import-substitution to export-led industrialisation, giving physical formto the state's drive to attract foreign direct investment (FDI) through multinational corporations.

Jurong's first anchor, the National Iron and Steel Mills (1961), supplied materials for the domestic construction sector and later expanded to exports. Unlike many factories that followed, it was a locally initiated venture. In 1964, the company was listed on the stock exchange and offered two million shares to the public, raising $12 million and giving Singaporeans a chance to own a direct stake in the new industrial economy. Architecturally, its expansive atria and curved reinforced concrete echoed the modernist vocabulary of Brazilian architect Oscar Niemeyer, showing how even utilitarian factories could project a language of progress.

Most other enterprises reflected the foreign-investment model that the Economic Development Board actively courted. The McGraw-Hill Far Eastern Publishing Factory (1969), one of the first American investments in Jurong, combined factory floors with landscaped courtyards and air-conditioned offices. These provisions offered workers respite and comfort in an otherwise industrial setting. Two years later, in 1971, the

Cooling Systems and Flexibles Factory, Singapore's first Indian-owned plant, produced automotive components in a facility designed with on-site welfare amenities such as a basement canteen and sports facilities. Though privately driven, both factories demonstrated how planning incentives nudged firms to embed welfare into design, making Jurong more attractive as a place to live and work. By 1969 Jurong already housed 181 factories and a workforce of 20,000. These were supported by sound fiscal and monetary policies, which gave foreign investors confidence in Singapore's industrial future.

Jurong was also deliberately embedded within Singapore's wider logistics network. A dedicated railway extension line linked the estate to the Malayan Railway, feeding exports directly to the southern docks. In 1963, the government opened Jurong Port and Shipyard, extending Singapore's maritime economy into shipbuilding and repair to complement manufacturing.

An equally important dimension of Jurong was its role in cultivating people and building a holistic community. Industrialisation was not only about factories and infrastructure; it was also an important step to attract, train, and grow talent for the new economy. From the outset, the government invested heavily in education with a particular emphasis on technical skills, ensuring that Jurong would generate not just jobs, but a workforce prepared to take them up. Technical schooling under the Vocational and Industrial Training Board (VITB), and specialised institutes such as the French–Singapore and German–Singapore Institutes, created a steady pipeline of skilled workers, while the Science Centre (1977) showcased Singapore's technological ambitions and nurtured interest among the young.



Figure 9: Jurong Town Hall. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Most of these people also lived, played, and worked within the town itself. The Jurong Town Corporation (JTC), created in 1968 to take over from the EDB in developing industrial land, was tasked not just with building factories but with shaping an environment for workers and their families. Public flats rose alongside company-sponsored housing, with employers incentivised to provide accommodation so that employees could live close to their workplaces. By 1969, Jurong town housed 16,000 residents, complete with wet markets, clinics, schools, cinemas, and recreational amenities. Jurong Lake became a leisure destination where workers could enjoy boating for free, and later the Jurong Bird Park reinforced the estate's role in Singapore's 'Garden City' vision, softening the industrial landscape with natural spectacle.

As Jurong Town matured, it was deliberately staged as a symbol of modernity and national pride. Architecture projected independence, egalitarianism, and a forward-looking identity. The Jurong Hill Lookout Tower, opened in 1969, was a strikingly futuristic structure designed without stairs and accessible only by a ramp, offering panoramic views of the new industrial landscape to both residents and visiting dignitaries (Figure 8). The Jurong Town Hall was completed in 1974, and as the administrative centre of Jurong it became an even more powerful emblem (Figure 9). Built in the bold concrete forms of the Metabolist style, its modular structure and prominent digital clock tower embodied time, productivity, and state oversight. In these monumental forms, Jurong stood as a national showcase, the architectural face of Singapore's industrial future.

The Reorganisation of Singapore's Shipyards

In parallel with Jurong, the reorganisation of Singapore's shipyards formed another pillar of industrialisation. The United Nations mission had also identified ship repair as a natural industry for Singapore, one that could capitalise on its deep harbour while providing large-scale employment. In 1964 the Singapore Harbour Board was restructured: the Port of Singapore Authority (PSA) took over port operations, while its repair facilities were hived off as Keppel Shipyard Pte Ltd (1968), inheriting the dry docks and workshops at Keppel Harbour and carrying forward over a century of commercial ship repair.

Equally significant was the Singapore Naval Base at Sembawang, opened in 1938 as part of Britain's Far Eastern defence strategy (Figure 10). Built with massive dry docks, floating docks, deep-water berths, and extensive workshops, it was converted into Sembawang Shipyard Pte Ltd after Britain's military withdrawal in 1968. Both Keppel and Sembawang carried forward rigorous apprenticeship schemes that recruited local teenagers into multi-year programmes of craft training and technical education. At Sembawang, this system built directly on the Royal Navy's earlier scheme, remembered by alumni as formative not only for technical skills but for discipline and drive. Together, these programmes produced a generation of marine engineers who sustained the ship repair industry, staffed Jurong's refineries and steel mills, and later supplied

or serviced multinational corporations; some even founding their own firms. The shipyards thus became both industrial anchors and training grounds, turning inherited infrastructure and labour into vital engines of Singapore's industrialisation.

Industrialisation at the Neighbourhood Scale

From the 1960s onwards, Singapore pursued a parallel strategy to Jurong's heavy industries: embedding light industry directly within new satellite housing estates.

The first of these was Queenstown, planned earlier by the Singapore Improvement Trust (SIT). Conveniently close to the Malayan Railway, its sidings connected estates directly to the docks, making it a logical location for integrated housing and industry. SIT experimented with high-rise housing such as Forfar House (1953) and Princess House (1950s), anticipating a growing population. By the 1960s, nearby Tanglin Halt had become an industrial hub in its own right, hosting dozens of factories producing electronics, garments, aluminium goods, and chocolate. Among these were Singapore Electronics aka Setron (1964), and Van Houten chocolate factory (1950s), which provided workplaces for surrounding residents.

By the 1970s, this model extended across the island into new industrial towns such as Toa Payoh, Ang Mo Kio, and Woodlands. A notable example was the Seiko Instruments factory (1974) in Woodlands, a Japanese company which introduced precision manufacturing and skills training into Singapore's industrial mix.

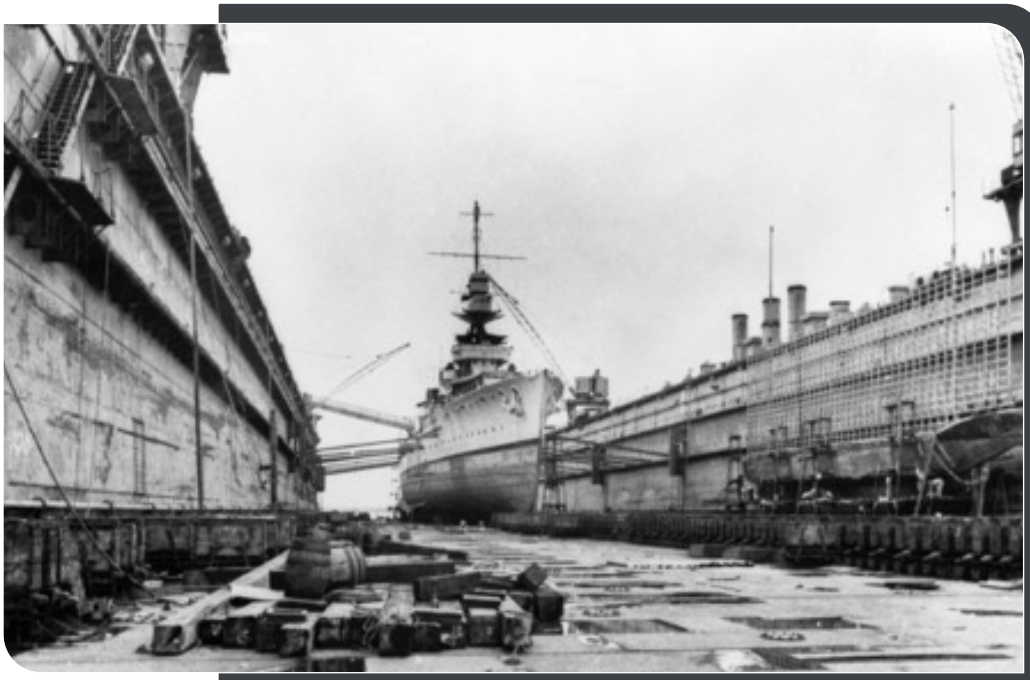


Figure 10: Singapore Naval Base at Sembawang, 1941

This strategy worked at both large and small scales. On the small end, it took shape in the flatted factory (Figure 11), an experimental typology conceived by the Economic Development Board (EDB) and later carried forward by JTC. Echoing Albert Winsemius's 1963 recommendations, these blocks housed labour-intensive trades like garments, shoes, and assembly, embedding them directly within housing estates to provide quick, accessible jobs for ordinary Singaporeans.

The first flatted factory, Block 115 Commonwealth Drive, was completed in 1965 within Queenstown. It provided affordable multi-storey units for trades such as shoemaking, metalwork, and apparel, with open-plan floors, hoisting bays, and a distinctive vehicle ramp to facilitate logistics. Block 115 set the template for a wave of 38 similar factories across Singapore, many later developed by JTC. By the 1980s, the typology evolved further into the ramp-up factory, where trucks could drive directly to upper floors, with Woodlands Spectrum marking the height of this experiment (Figure 12).



Figure 11: JTC, Singapore's first flatted factory, built in 1965, and containing multi-storey manufacturing units for a variety of trades. Photograph by Darren Soh. CC-BY-SA 3.0 IGO



Figure 12: Woodlands Spectrum 'ramp-up factory'. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Powering the Town and Industry

Behind every stage of Singapore's industrialisation was the question of power. From the late nineteenth century, rapid growth in trade and population and the population rising from 10,000 in 1824 to over 220,000 by 1900 demanded ever greater energy to sustain docks, workshops, and industries.

The answer took architectural and geographical form in a chain of power stations built across the island. St James Power Station (1926), beside Keppel Harbour, introduced the red-brick, steel-truss vocabulary of industrial modernity (Figure 13). Its main purpose was to power the docks and, secondarily, the growing city, but demand quickly outstripped its capacity. To relieve the load, the Pasir Panjang Power Station (1953–54, expanded in the 1960s) was built further west, supplying electricity to the downtown core as well as the expanding western industrial belt. Its massive spanning steel structures brick façades echoing the design language of its predecessor.

The Jurong Power Station (1971–72) marked a decisive shift: constructed within the new Jurong Industrial Estate, it embodied the functional logic of powering factories at the heart of Singapore's export-led economy. At the same time, a new generation of substations extended the grid into new satellite towns. The Telok Blangah Substation (1974), serving the new Telok Blangah satellite town, was designed by Kumpulan Akitek with a bronze-anodised curtain wall and glazed bays, giving an unexpectedly refined modernist face to an otherwise utilitarian typology. Such substations symbolised the broader infrastructural push to deliver reliable power across Singapore's expanding estates.

Seen together, these stations reveal an architectural lineage and a geographical logic that tracked Singapore's industrial expansion: from port to city, to new docks, and finally to the industrial town. More than functional plants, they anchored economic growth and stood as monuments of infrastructural modernity across both colonial and postcolonial orders.



Figure 13: St James Power Station, built in 1926. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Oil and Industrial Modernisation in Singapore

The history of oil in Singapore began in 1891, when M. Samuel & Co. of London established an oil depot on Pulau Bukom, an off-shore island, to import kerosene from Russia for distribution across Asia. The company later merged with Royal Dutch Petroleum in 1907 to form Royal Dutch Shell. This merger positioned Singapore as a key regional hub in the interwar years for the reception, storage, and shipment of oil across the East Indies and British Borneo, marking Pulau Bukom as one of the earliest industrialised offshore sites in Singapore.

By the mid-1950s, oil had overtaken coal as the dominant global fuel source, aligning with Singapore's post-war industrialisation programme under Dr. Albert Winsemius. His national plan envisioned a diversified economy encompassing heavy industries such as shipbuilding and repair, alongside manufacturing and component production. Oil refining became essential to this framework, providing both the energy to power Singapore's expanding shipyards and port operations at the emerging Jurong and Pasir Panjang ports, and the refined products for export. This proved a remarkably prescient vision: today, Singapore stands as 'the undisputed oil hub of Asia'. Its oil industry remains deeply integrated into global supply chains, importing crude primarily from the Middle East and exporting refined fuels and petrochemical products across the Asia-Pacific.

Geographically, Pulau Bukom's offshore location made it an ideal refinery site. Refining is a highly pollutive process, and locating it on a remote island kept industrial emissions away from urban centres while allowing direct access to deep-water docking facilities for oil tankers. In 1961, Shell opened the Bukom Refinery, then the largest in South-East Asia, followed by a S$20-million residential and recreational complex for its staff. By the 1970s, additional refineries by Esso, Mobil, and the Singapore Refinery Company emerged onneighbouring islands - later amalgamated into Jurong Island (1995–2000), a larger separate petrochemical hub. Today, as the world moves toward renewable energy, Pulau Bukom and Jurong Island stands as a future relic of Singapore's oil-powered industrial age.

Conclusion

Singapore's industrial story is a collection of continuities and reinventions across two centuries. What began as a mercantile riverine hub was reshaped by plantations, colonial infrastructure, and post-war planning, each stage layering new forms of work, settlement, and architecture onto the landscape. By the time of independence, industrialisation had become both an economic necessity and a state-led project, embodied in Jurong's swamplands, turned into steel mills, schools, and housing estates. Yet smaller neighbourhood factories, flatted blocks, and the enduring chain of power stations remind us that industrialisation was as much about everyday life and infrastructure as it was about grand visions. These landscapes chart how the city was made and remade through experimentation, and through economic and social pressures, into an industrial nation.

National Inventory or Database for the Country's Built Heritage

Singapore's National Heritage Board (NHB) maintains the official list of National Monuments, currently numbering 75, protected under the Preservation of Monuments Act and administered by the Preservation of Sites and Monuments (PSM) division. The Urban Redevelopment Authority (URA) oversees more than 7,000 conserved buildings under its Conservation Programme. While URA does not maintain a centralised public inventory, these buildings can be identified through its Master Plan and planning maps.

NHB provides access to its list of National Monuments via the 'Places' section of the Roots.sg portal. The inventory of conserved buildings maintained by URA is not published as a fully downloadable national-heritage database. Instead, once can identify conserved buildings via URA's published maps or Master Plan overlays.

Singapore's National Inventory includes some industrial heritage sites to a limited extent. Sites such as Tanjong Pagar Railway Station, St. James Power Station, and Sembawang Naval Base are included, and these have been conserved or gazetted as National Monuments individually. However, industrial heritage is not formally recognised as a distinct category, nor systematically documented within the national framework. Inclusions occur on an ad-hoc basis, often through individual assessments rather than thematic policy. Consequently, there is no comprehensive or coordinated recognition of industrial heritage within Singapore's national inventory at present.

System of Statutory Protection

Singapore has a clear system of statutory protection for built heritage, administered under two main authorities. The Preservation of Sites and Monuments division of the National Heritage Board protects National Monuments under the Preservation of Monuments Act (1971), providing the highest level of legal protection. Separately, the Urban Redevelopment Authority safeguards conserved buildings under the Planning Act through its Conservation Programme. Both systems require a rigorous submission and approval process for any proposed alterations, new uses, or adaptive reuse works, ensuring that conservation principles and planning guidelines are met before implementation. Industrial heritage sites that have been gazetted as National Monuments or designated as conserved buildings are protected under Singapore's statutory framework. These fall under either the Preservation of Monuments Act (PSM/NHB) or the Planning Act (URA) respectively. Examples include St. James Power Station, Tanjong Pagar Railway Station, and parts of the Sembawang Naval Base, which are legally safeguarded through these mechanisms. However, such cases remain selective rather than comprehensive, as industrial heritage is not formally recognised as a distinct protection category within existing legislation.

Sustainability of the Recognised Industrial Heritage Assets and their Contribution to the SDGs.

Recognised industrial heritage assets in Singapore contribute to Sustainable Development primarily through adaptive reuse, aligning with SDG 11.4 (strengthen efforts to protect and safeguard cultural and natural heritage) and SDG 12.2 (sustainable use of resources). Projects such as St. James Power Station (converted into offices and public heritage spaces) exemplify sustainable conservation by reducing demolition waste and extending building life cycles. These cases demonstrate how industrial heritage supports urban regeneration, cultural continuity, and resource efficiency. However broader policy frameworks for systematically integrating industrial heritage into sustainability agendas remain limited.

References:

Ho, Stephanie. "Alexandra." Singapore Infopedia, June 20, 2016. https://www.nlb.gov.sg/main/article-detail?cmsuuid=65a21ad2-f54a-4700-ab87-1b847384ab02.

Ho, Weng Hin, Dinesh Naidu, Kar Lin Tan, and Jeremy Tzer Ning San. Our Modern Past: A Visual Survey of Singapore Architecture 1920s-1970s. First edition. Singapore Heritage Society : SIA Press Pte Ltd, 2015.

Loh, Kah Seng. Theatres of Memory: Industrial Heritage of 20th Century Singapore. Pagesetters Services Pte Ltd, 2021.

National Library Board. "Industrial Revolution." August 2025. https://curiocity.nlb.gov.sg/digital-stories/jurong/jurong-industrial-estate-development/.

Ng, Jason. "Industrial Heritage I: Colonial Godowns and Airport Hangars." Docomomo Singapore. 2021. https://www.docomomo.sg/happenings/industrial-heritage-i-colonial-godowns-and-airport-hangars.

Ng, Jason. "Industrial Heritage II Đ Power Stations and Jurong Industrial Estate." Docomomo Singapore, December 14, 2021. https://www.docomomo.sg/happenings/industrial-heritage-ii-power-stations-and-jurong-industrial-estate.

Pek, Sara. "Economic Development Board." Singapore Infopedia, December 21, 2017. https://www.nlb.gov.sg/main/article-detail?cmsuuid=1ea4456f-dac4-4f57-9f9d-35d24af35807.

Pwee, Timothy. "From Gambier to Pepper: Plantation Agriculture in Singapore." Biblioasia, April 1, 2021. https://biblioasia.nlb.gov.sg/vol-17/issue-1/apr-jun-2021/agriculture/.

Roots. "Former Tanglin Halt Industrial Estate." Roots, November 2021. https://www.roots.gov.sg/places/places-landing/Places/landmarks/my-queenstown-heritage-trail/former-tanglin-halt-industrial-estate.

Tan, Willie. "Spatial Restructuring of Singapore 1819 - 1991." Thesis for Doctor of Philosophy, Department of Urban and Regional Planning, University of Sydney, 1993.

Wee, Beng Geok. "The Story of Two Shipyards: Keppel & Sembawang." Biblioasia, July 31, 2019. https://biblioasia.nlb.gov.sg/vol-15/issue-2/jul-sep-2019/shipyards-keppel-sembawang/.

Wong, Yun Chii. "Transforming Workspaces, Dissapearing Bodies. The Landscape and Spaces of Work in Singapore." Singapore Architects, December 2004.

Wong, Yunn Chii, and Tai, Lee Siang. Singapore 1:1 Island: A Gallery of Architecture & Urban Design. With Urban Redevelopment Authority (Singapore). Urban Redevelopment Authority : Distributor, APD Singapore, 2007.

Thow Kwang Dragon Kiln



Figure 1: Thow Kwang pottery jungle, view of the firing kiln. Photograph by Meranda Tang. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

International Designation
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

State, Province, Region
Singapore

Industrial classification
Forest Industries; Industrial Communities
Other: Cottage Industries; Secondary Industries

Further details on the industrial classification
The Thow Kwang Dragon Kiln is closely tied to Singapore's forest and plantation industries, particularly rubber tapping, which relied on ceramic vessels for latex collection. It represents a secondary industry that sustained primary resource extraction, later adapting to shifts such as orchid export, temple urns, and decorative wares. Rooted in rural, migrant communities, the site embodies the integration of traditional kiln technologies with Singapore's broader industrial economy and the livelihoods that grew around it.

Brief description

By 1910, the area formed part of a vast rubber estate. With rubber tapping booming in the interwar years, there was enormous demand for ceramic pots to collect latex. Pottery became a vital secondary industry sustaining the primary rubber and forestry trades. In 1944, the Thow Kwang dragon kiln was built to meet this need. Constructed of local clay bricks, its 27-metre body hugs a slope with a chimney at one end. Fired at up to 1,300°C, it could hold thousands of wares, its serpentine form echoing the mythical dragon.

Dragon kilns were once widespread across Singapore with over a dozen operated in Jurong alone, with more scattered wherever slopes and clay made conditions suitable. They anchored village economies, where Teochew and Fujian families passed pottery skills across generations. Around each kiln grew small ecosystems: potters, farmers, and traders linked by the production and sale of wares. These industries supplied plantations, households, and later exports such as orchid pots in the 1970s.



Figure 2: Thow Kwang pottery jungle, interiors of the firing kiln. Photograph by Meranda Tang. CC-BY-SA 3.0 IGO

Though practical in purpose, pottery was never just a craft. Kiln operators treated firing as a negotiation with fire and clay. Prayers to the Earth God and Kiln God marked each cycle, and the kiln itself was seen as a living being whose 'temperament' had to be understood. Choosing the right wood, stoking flames for days, and achieving consistent results required knowledge refined through experimentation and handed down over generations.

Today, Thow Kwang survives as Singapore's last operational dragon kiln, rooted in rural, cottage-based production. It embodies how Chinese migrant communities adapted traditional kiln technologies from southern China to Jurong's clay-rich valleys. More than a craft site, it was an industrial support system for early plantation economies, a living testimony to migrant ingenuity and the rural industries that sustained Singapore's economic foundations.

Period(s) of operation

Pottery production at the site dates to c.1910, when traditional Hokkien three-chamber kilns served nearby plantations. In 1944, these were upgraded to the Thow Kwang Dragon Kiln, which produced vessels for rubber tapping and agriculture. Through the 1970s it adapted to orchid pots for export, later temple urns and decorative wares. Large-scale production declined by the 1990s, but the kiln remains active today as Singapore's last operational dragon kiln, now serving workshops and community use.

Key events/chronology and changes to relevant attributes

The landscape of dragon kilns in Singapore has dwindled drastically. Early pottery traditions began with Hokkien three-chamber kilns from the 1910s or earlier, but dragon kilns emerged from the 1940s, with Thow Kwang built in 1944 and another in 1958. In the 1960s–70s, oral histories recall at least ten kilns in Jurong, surrounded by village economies



Figure 3: The entrance of Thow Kwang Pottery jungle showing various shed structures. Photograph by Pupsocket50. Source: Wikimedia Commons. CC BY-SA 4.0

of migrant families. While the kiln structure itself changed little, owners and communities showed remarkable adaptability, aligning production with national shifts.

From the 1910s–60s, output centred on pots for rubber tapping and agriculture, reflecting Singapore's agrarian base. By the mid-1970s, demand shifted to orchid pots for export, before declining in the 1980s. At that point, temple demand for urns to hold ashes rose as graves were cleared for redevelopment, tying pottery to Singapore's rapid urbanisation. Later, decorative wares and links to Chinese markets reflected globalisation.
By the 1990s, cheap imports and redevelopment pressures caused a sharp decline, with most Jurong kilns demolished, including Sam Mui Kuang. Thow Kwang survived by shifting to import-export trade. In the 2000s, its land was slated for redevelopment into CleanTech Park; while one kiln was demolished, NHB secured lease extensions to prolong Thow Kwang's life.
Since 1998, the kiln has evolved into a public studio, workshop, and teaching space. Today, it anchors a new community of artists, enthusiasts, and advocates, while retaining its role as a family business. Thow Kwang thus mirrors Singapore's wider economic transitions while embodying resilience and continuity.

Status of the research and historical documentation

Research and documentation on the Thow Kwang Dragon Kiln are uneven. Pottery production on the site is recorded from c.1910, with the present dragon kiln constructed in 1944. Historic maps confirm its presence within plantation landscapes. Oral histories, such as those with Mr Tan Teck Yoke (Singapore Memory Project) and Lee Yong Lee (National Archives of Singapore), provide first-hand testimony of ownership, operation, and community life.

Published media sources include Channel NewsAsia (Woo & Ooi, 2024), which visually documents kiln firings, and the National Heritage Board's Roots feature The Dragon Kiln Breathes, which outlines the kiln's functioning and present-day use. Academic research includes a peer-reviewed chapter by Bussey (2015) in Heritage Futures: Thow Kwang Dragon Kiln and Creative Traditionalism in Singapore and unpublished NUS theses, though these remain less publicly accessible due to paywalls or restricted access. Family-held collections (e.g. photographs, catalogues) may exist but are not formally archived. No systematic business records or logbooks are known. Most sources are in English, though some oral accounts are in Mandarin or dialect.

There remain significant gaps, especially in understanding the kiln's economic role within Singapore's industrial development and in tracing the broader network of demolished kilns in Jurong. Existing records may be accessible through NAS, NHB, and selected academic libraries, but a comprehensive study has yet to be undertaken.

Current status and state of conservation

The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). Its heritage significance, however, was recognised when it was a recipient of the Stewards of Intangible Cultural Heritage Award 2020. It is presently largely intact and is still operational as a dragon kiln, even if the former agricultural industries that it had supported during the pre-independence period had been expunged. Since the 1980s, it responded to the high demand of pottery wares and has since catered to existing and budding pottery connoisseurs.

Known threats

The Thow Kwang Dragon Kilns are situated on a plot designated for 'Park' land use in the URA Master Plan 2019. As both the Thow Kwang Dragon Kilns and the plot of land that it is situated upon are not gazetted for conservation, it does not enjoy legal protection and thus remains susceptible to change or expungement brought about by future development plans.

Protection status

As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.



Figure 4: Thow Kwang pottery jungle, view of the firing kiln. Photograph by Meranda Tang. CC-BY-SA 3.0 IGO



Figure 5: A prayer altar next to the kilns. Photograph by Meranda Tang. CC-BY-SA 3.0 IGO

Registration status in the national or local inventory

No.

Ownership

Thow Kwang, a family business. Mr Tan Teck Yoke and Ms Yulianti Tan.

Former Tong Nam Tobacco Co.



Figure 1: View of Tong Nam Tobacco Factory from 540 Macpherson Road, 2024. © 2026 Google

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

Industrial classification
Agricultural & Fishing; Processing and manufacturing industries; Secondary Industries

Further details on the industrial classification
The site reflects multiple industrial layers. It was tied to agricultural industries, processing tobacco leaves cultivated in rural areas such as Lim Chu Kang and Pulau Tekong. As a secondary industry, it transformed raw crops into consumer goods, producing cigarettes at scale for the local market. Finally, it represents processing and manufacturing industries, where mechanized facilities enabled daily output of hundreds of kilograms of tobacco. Together, the site illustrates the integration of agriculture with mid-20th-century industrial production and consumer demand in Singapore.

Brief description
Situated at the intersection between MacPherson Road and Harvey Road, stands a two-storey modern-style shophouse that once housed the now defunct Tong Nam Tobacco Co. (TNTC), a major tobacco manufacturer that formerly produced cheap local cigarettes for the Singapore population. Built in 1956, the building featured conventional architectural elements from slanted external columns to sloping ornamental hoods, yet its unique design lies in its use of flat roofs over traditional pitch roofs, which was believed to be inspired by the modern tropical architecture designs of colonial structures designed in Ghana and Nigeria. With this new facility, the company was capable of processing up to approximately 363kg of tobacco and 576,000 sticks of cigarettes per day, and over the next 20 years, produced many familiar locally sourced cigarettes.

The site is significant for its link to tobacco farming, an overlooked chapter of post-war agricultural history. Backed by colonial incentives in 1948, tobacco became a modest but important cash crop in the 1950s–60s, grown in Pulau Tekong, Lim Chu Kang, and other rural areas. At its peak it was Singapore's fourth-largest agricultural revenue source. Local cigarettes were favoured over imports, tying the factory directly to plantation landscapes and everyday consumption.

TNTC's lineage reaches further: it originated from Kwong Hang Ho, one of the(seven large Chinese trading firms) that dominated 19th-century provision markets in rice, oil, sugar, tea, and tobacco. This positions the site within the traditions of Chinese mercantile society that shaped Singapore's economy.

Unfortunately, with the advent of globalisation and competition from international tobacco brands that sold tobacco for a lower cost, they soon became less attractive to their customers.



Figure 2: View of Tong Nam Tobacco Factory from 1 Harvey Road, 2024 © 2026 Google

Furthermore, the local redevelopment of rural areas like Choa Chu Kang, Bukit Panjang and Kranji depleted the firm's main source of tobacco leaves and high taxes charged on tobacco in a bid to deter smoking as part of the government's anti-smoking campaign since the early 1970s resulted in an eventual plunge in the firm's sales and Tong Nam ceasing its operations in the late 1980s, though the firm continues to have ownership of the site.

Period(s) of operation
1956 – late 1980s

Key events/chronology and changes to relevant attributes
The Tong Nam Tobacco Co. building was constructed in 1956 as a modern-style shophouse factory. From the late 1950s to the 1970s, it operated as one of Singapore's key local cigarette manufacturers, processing around 363 kg of tobacco and producing over half a million cigarettes daily.

By the 1970s, international competition, government anti-smoking campaigns, higher tobacco taxes, and the redevelopment of rural areas supplying tobacco led to a steady decline in production. Operations ceased in the late 1980s, marking the end of TNTC's role in the industry.

Architecturally, the building has seen little alteration. Its distinctive features—flat roofs replacing the traditional pitched form, slanted columns, and ornamental hoods—remain intact. The main change has been functional: from an active industrial site to a defunct but well-preserved commercial property.

Today, the building retains high physical integrity and continues to reflect the rise and decline of Singapore's local tobacco industry and mid-20th-century industrial development.

Status of the research and historical documentation
Documentation on the former Tong Nam Tobacco Co. building remains sparse. The Roots survey (NHB, 2019) gives a brief overview of its architecture and use, while *Remember Singapore* (2024) provides a narrative on the tobacco industry's rise and decline. Newspaper mentions exist but are not comprehensive, and no peer-reviewed or detailed academic study has been undertaken.

Significant gaps remain: no building drawings, tenancy or occupation records, or business histories have been identified; little is known of daily operations, workers' lives, or the firm's industrial connections to local agriculture. As the site is privately owned, company records, logbooks, or catalogues are inaccessible and may no longer survive.

Available materials are mainly in English, with some possible Chinese sources. Overall, the historical record is fragmented, and systematic research is still needed to establish the site's role in Singapore's mid-20th-century industrial landscape.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM).

It is presently unoccupied, with its facade and architectural features largely intact. Although the company ceased its operations in the late 1980s, the company was registered under sole proprietorship, and it continues to retain ownership of the building till today.

Known threats
The site is privately owned and currently unoccupied. While the building remains intact, prolonged vacancy has led to gradual deterioration. As it is not protected under conservation status, its future depends entirely on the owner's decisions. There are no concrete plans for reuse or maintenance, and the absence of active occupation or protective measures poses risks of neglect, demolition, or unsympathetic redevelopment. No formal actions have been taken to safeguard the site's heritage value.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, it does not have any form of protection from the local or national government.

Registration status in the national or local inventory
None

Ownership
Tong Nam Tobacco Co. (TNTC)

Sembawang Shipyard or Sembawang Naval Base



Figure 1: Aerial of Sembawang Shipyard today. Photograph by Scott Cameron. Source: Wikimedia Commons. CC BY 3.0

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

International designation
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

Industrial classification
Communications
Engineering; Infrastructure
Industrial Communities
Transport
Military

Further details on the industrial classification
The Sembawang Naval Base reflects multiple industrial classifications. As a Royal Dockyard, it was an engineering and infrastructure hub for ship repair, fitting, and supply. Its extensive railways, docks, cranes, and workshops formed a key node in global naval communications and military transport networks. At the same time, it sustained large industrial communities of naval and civilian workers, whose labour, training, and union activity tied the site to Singapore's wider industrial and political history.

Brief description

Constructed between 1928 and 1941, the Sembawang Naval Base was developed through extensive land reclamation and incorporated the H.M. Naval Dockyard and Fleet Shore Accommodations. At its heart stood the King George VI Dock, the largest dry dock in the world at its completion, capable of servicing the Royal Navy's most powerful warships at the height of its global dominance. As the last Royal Dockyard built by Britain, it represents the culmination of centuries of naval-industrial tradition.

Architecturally and technologically, the Base is highly significant. It embodies the functional design of Royal Dockyards as complex industrial centres built to construct, supply, and repair ships. Its hallmark features include deep-water harbourage, massive docks and slips, sawtooth-roof workshops for fabrication, reinforced electrical shops, railway and crane systems, and extensive storage yards. These were complemented by barracks, mess halls, parade grounds, and recreational clubs, mirroring naval life while adapting to Singapore's tropical climate. The Base also reflects early 20th-century Garden City planning, with buildings spaced across natural topography and interspersed with green belts, places of worship, and recreational grounds. Thus creating one of the most ambitious colonial industrial settlements outside Britain.

For the British, Sembawang was both a strategic stronghold and a 'home away from home'. Micro-communities also flourished: Malayalee and Chinese workers introduced theatre, literature, sports, and festivals into everyday life, weaving cultural identity into an otherwise utilitarian landscape. Politically, it was a hallmark of labour consciousness. Ethnic workers who faced discrimination under colonial rule built strong traditions of unionisation, some later becoming political leaders during Singapore's independence movement.



Figure 2: Two Royal Australian Air Force Avro Lincoln heavy bombers flying over Singapore Naval Base, 1953. Source: Wikimedia Commons. Public domain

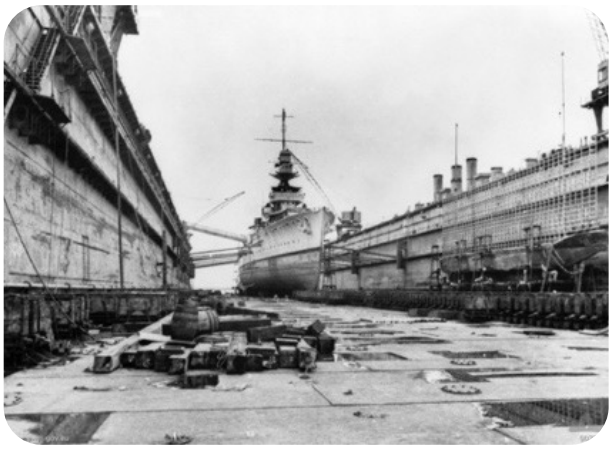


Figure 3: A British Danae-class light cruiser inside the Admiralty IX Floating Dry Dock at Singapore Naval Base, in September 1941. HMS Dragon (D46) and HMS Durban (D99) were based at Singapore at that time. Source: Wikimedia Commons. Public domain

During the Japanese Occupation, its meaning shifted to one of hardship, as local workers endured harsh conditions that embodied the trauma of civilian labour under military rule. After the war, the Base became one of Singapore's largest shipyards, serving as a de facto training ground for apprentices, engineers, and divers who later powered the nation's industrial growth.

Sembawang Naval Base is thus an outstanding example of a modern Royal Dockyard: combining industrial functionality, naval tradition, and ambitious town planning with intangible legacies of cultural expression, resilience and political agency. It remains significant

both locally and globally for its enduring impact on architecture, industry, labour, and national development.

The Sembawang area was first surveyed in the early 19th century, and by the late 1800s it had shifted from pepper and gambier farming to large rubber plantations, supported by new roads and cleared forest. This made it an attractive site for a naval base: cheap land, swampland easily fortified, and strategic proximity to Johor and the Straits of Malacca.

Plans for a 'Gibraltar of the East' were formalised after World War I through the 1919 Singapore Strategy. Ambitious initial schemes were scaled down, but construction proceeded through the 1920s–30s. Extensive land reclamation, diversion of rivers, excavation of millions of cubic yards of soil, and laying of rail links transformed swamp into dockyard. The King George VI Dock, opened in 1938, was then the largest in the world. Surrounding it were workshops, cranes, barracks (HMS Terror), and accommodation planned with Garden City principles.

The Base was bombed in 1941 and deliberately scuttled, but taken largely intact by the Japanese in 1942, who restored docks and workshops and built tunnels and new fortifications. Returned to Britain in 1945, it underwent years of repairs and by the 1950s became the Royal Navy's main Far East hub, employing thousands, with new welfare facilities like the Armada Club (1960) and Royal Sailors' Rest (1963).

Following Britain's 1968 withdrawal, the Base was handed to Singapore, converted into Sembawang Shipyard in 1971. It became the nation's largest employer and a centre for technical training, expanding through modernisation in the 1970s–90s. Despite redevelopment of surrounding lands into industrial estates and new towns, many original structures remain intact. Today the yard continues in commercial use under Seatrium, while large parts of the former Base have been repurposed for residential and industrial development.

Status of research and historical documentation

The Sembawang Naval Base is well documented, with extensive archival, published, and oral history sources. The National Archives of Singapore (NAS) and UK National Archives hold maps, building plans, photographs, and Admiralty records, while contemporary newspapers such as the Straits Times, Singapore Free Press, Shonan Times, and New Nation provide detailed accounts of construction, operations, and labour. Key publications include Chew's Of Hearts & Minds: The Story of Sembawang Shipyard (1998), McIntyre's The Rise and Fall of the Singapore Naval Base (1979), Murfett's Between Two Oceans (2004), and more recent heritage studies such as the NHB-commissioned Sembawang Report (2021). Equally significant are the rich oral history interviews (OHIs) with former workers, families, and naval personnel, many of which are preserved in the National Archives of Singapore. These are complemented by biographies, memoirs, and oral history excerpts incorporated into NHB reports, which document labour conditions, union movements, and everyday social and cultural life in and around the Base. Together, they provide invaluable depth, adding voices and lived experiences that complement formal engineering and administrative records. Company records, newsletters (SS News, 1970s), and union publications add further insight into the Base's industrial and social roles in the post-independence decades. Ongoing work by Studio Lapis is consolidating these resources through a full architectural heritage survey, conservation management plan, and landscape study, ensuring systematic coverage for future urban planning.

Together, these sources form a strong, multi-layered body of documentation in English, safely housed in NAS, NLB, and institutional repositories, with many accessible to the public.

Current of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). It is presently largely intact and is presently still operational as a shipyard, thus extending from its historic use since the interwar period.

Known threats
The Sembawang Shipyard/Sembawang Naval Base has been identified for re-development in URA's latest iteration of the Draft Master Plan 2025 as the operations in the Sembawang Shipyard winds down in 2028. It will be converted into a mixed-use waterfront lifestyle district, subjecting many buildings and historic elements on the site to be susceptible to change or expungement brought about by future development plans.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.

Registration status in the national or local inventory
No

Ownership
The site is presently operated by Seatrium Limited

Local contacts
Key local contacts include Studio Lapis (SL), which is currently undertaking comprehensive heritage research and conservation planning for the site, and the National Heritage Board (NHB), which has previously commissioned reports and holds significant archival and oral history resources. Both institutions would be able to provide further information and facilitate access to documentation.

Studio Lapis
Contact Person: Mr. Weng Hin, Principal Director

Website: www.studiolapis.sg
National Heritage Board (NHB) – Heritage Policy & Research Division
Contact Person: Ms. Melissa May Tan, Director (Heritage Policy & Research)
Website: www.nhb.gov.sg

McGraw-Hill Far Eastern Publishing Factory





Figure 1: McGraw-Hill Far Eastern Publishing Factory. Photograph by Ho Weng Hin. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

International designation
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

Industrial classification
Paper, Glass and Packaging; Industrial Communities

Further details on the industrial classification
The site is classified under Paper, Glass and Packaging as it functioned primarily as a publishing and printing facility, producing textbooks and technical materials for regional distribution. It also falls under Industrial Communities, as the factory combined industrial production with editorial and administrative functions, bringing together blue- and white-collar staff within a shared workplace. This integration was unusual for Jurong's heavy industries, reflecting a more human-centred approach to industrial architecture.

Brief description

Completed in 1969, the McGraw-Hill Far Eastern Publishing Factory in Jurong Industrial Estate marked the entry of American investment into Singapore's new industrial hub. At a time when the Economic Development Board was courting global capital to drive industrialisation, its presence reflected the diversification of foreign investment beyond regional and European manufacturers. Unlike many factories in Jurong dedicated to heavy industry, McGraw-Hill represented a knowledge-based enterprise, linking Singapore's industrial development to education and publishing as part of nation-building.

Designed by BEP Akitek, it was unusual for its time in combining blue-collar factory space with white-collar editorial and administrative offices, reflecting the publishing house's dual identity as both manufacturer and cultural producer.

Architecturally, the building is distinguished by its modernist design and attention to human-centred detail. A cantilevered concrete roof supported by elegant H-shaped frames with bronze-tiled grooves shades full-length ribbon windows, while landscaped courtyards softened the industrial setting. At the heart of the complex stood a boardroom pavilion set within a reflecting pool, approached via cascading umbrella canopies and framed by water features whose sound offered respite from Jurong's heavy industries. This integration of ornament, landscaping, and climatic adaptation exemplifies the ambition to create delight in an industrial environment.

Functionally, the factory produced textbooks and technical publications, supporting Singapore's educational and economic growth during the rapid industrialisation of the 1970s. Its design mirrored this aspiration, offering light-filled, air-conditioned spaces that balanced productivity with well-being. Symbolically, the factory's opening by then-Finance Minister Dr Goh Keng Swee underscored the importance of knowledge, books, and publishing as moral and cultural counterweights to the perceived risks of unrestrained industrial growth.



Figure 2: McGraw-Hill Far Eastern Publishing Factory. Photograph by Ho Weng Hin. CC-BY-SA 3.0 IGO

Though heavily altered today, the site is historically significant as a rare example of industrial modernism in Jurong that combined advanced industrial planning with architectural sensitivity. Intangibly, it represents the cultural aspirations of Singapore's nation-building era where education, knowledge, and publishing were positioned as integral to industrial development, and where architectural design sought to humanise the factory landscape.



Figure 3: McGraw-Hill Far Eastern Publishing Factory. Photograph by Ho Weng Hin. CC-BY-SA 3.0 IGO

Period(s) of operation

The McGraw-Hill Far Eastern Publishing Factory was constructed in 1969 and began operations the same year. It functioned through the 1970s–1990s as both a publishing house and printing facility, supporting Singapore's education and industrialisation efforts. In later decades, operations were scaled down and the site was taken over by PSC Group, with major renovations altering the original courtyard and interiors.

Key events/chronology and changes to relevant attributes

The McGraw-Hill Far Eastern Publishing Factory was completed in 1969 at Jurong Industrial Estate and opened by Finance Minister Dr Goh Keng Swee. Its establishment marked the beginning of major American investment in Singapore's new industrial zone, and it was notable for combining industrial printing with editorial and administrative offices—rare in Jurong's otherwise utilitarian landscape. From the late 1960s through the 1980s, the factory produced textbooks and technical publications that supported Singapore's rapid educational expansion and industrial development. Its modernist design, with landscaped courtyards, a water-featured boardroom pavilion, and shading elements, embodied a humanistic approach to factory architecture. This reflected wider aspirations that industrialisation could be tempered with cultural refinement and worker well-being.

By the 1990s, wider restructuring of the publishing industry and globalisation reduced the scale of on-site operations. The property was subsequently taken over by PSC Group, which undertook major renovations. Much of the landscaped courtyard and water features were removed or altered and little of the courtyard survived, though the overall external form and distinctive modernist façade elements cantilevered roof, column frames, and ribbon windows remain recognisable.

Status of the research and historical documentation

Documentation on the Former McGraw-Hill Far Eastern Publishing Factory is limited but includes some key sources. Most importantly, BEP Akitek themselves published an account of the building, providing architectural details and intent. In addition, the site has been highlighted in heritage advocacy, notably Jason



Figure 4: McGraw-Hill Far Eastern Publishing Factory. Photograph by Ho Weng Hin. CC-BY-SA 3.0 IGO

Ng's article for DOCOMOMO Singapore (Industrial Heritage II: Power Stations and Jurong Industrial Estate, 2021).

Local newspapers reported on its 1969 opening by Finance Minister Dr Goh Keng Swee, though systematic coverage of its operations is scarce. It is likely that further materials such as architectural plans, photographs, or administrative records may exist in the National Archives of Singapore (NAS), but these have not yet been verified.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). The original tenant of the building has since changed, and the site has been changed extensively thus rendering the site to be of moderate intactness. For example, the extensive renovations meant that little of the original courtyard had survived.

Known threats
The former McGraw-Hill Far Eastern Publishing Factory is situated on a plot designated for 'Business' land use in the URA Master Plan 2019. As both the former McGraw-Hill Far Eastern Publishing factory and the plot it is situated upon are not gazetted for conservation, it does not benefit from legal protection and thus remains susceptible to change, or expungement brought about by future development plans. In addition, the shorter leases attributed to business/ commercial plots (as opposed to residential plots) add developmental pressure on the historic site.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.

Registration status in the national or local inventory
No.

Ownership
The site is currently being occupied by the PSC Group.

Local contacts
Docomomo Singapore (DocomomoSG)
Website: www.docomomo.sg

Cooling Systems and Flexibles Factory



Figure 1: Cooling Systems & Flexibles Factory. Photograph by Jeremy San. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

International designation
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

Industrial classification
Chemicals; Energy; Engineering; Industrial Communities

Further details on the industrial classification
The factory is classified under Chemicals and Engineering for its production of automotive components such as radiators, hoses, and couplings, which relied on specialised materials and precision processes. It also relates to Energy, as many products supported cooling and fuel systems for vehicles and machinery. Finally, it falls under Industrial Communities, reflecting its role as a large employer in Jurong, with facilities such as a basement canteen and sports amenities that shaped worker life.

Brief description
Opened in September 1971, Cooling Systems and Flexibles was Singapore's first Indian-owned factory and the nation's pioneering auto spare parts plant. Established by Bombay-based Teksons on a 2-hectare site in Jurong Industrial Estate, the S$4 million facility produced radiators, heat exchangers, oil and fuel lines, brake hoses, and couplings for cars and tractors. It quickly became a global exporter reaching 30 countries at its opening and over 70 by 1979 . During the 1960s–70s, Singapore's industrialisation strategy under the Economic Development Board (EDB) relied heavily on attracting international companies to anchor Jurong Industrial Estate. Most early investments came from Western, Japanese, and later American firms, drawn by government incentives, infrastructure, and access to regional markets. Cooling Systems and Flexibles was unusual in this landscape: as Singapore's first Indian-owned factory, it marked the diversification of foreign investment beyond traditional industrial powers.

Designed by the Architectural Design Group, the factory demonstrates the modernist vocabulary of early Jurong industries. Its monumental projecting roof slab, supported by slender white tapering columns, frames a recessed entrance clad with bronze tiles. The design nods to both Classical precedents and contemporary architectural influences such as Oscar Niemeyer's Palace of the Dawn in Brasília. The sawtooth roof of the factory floor and precast perforated concrete screens created a light-filled and naturally ventilated workspace, combining efficiency with climatic adaptation.

Social and welfare provisions were also central to its design. Cooling Systems and Flexibles was the first factory in Singapore to include a basement canteen, while recruitment advertisements promoted on-site sports facilities as part of a progressive approach to labour welfare. The open-plan main office was deliberately oriented to



Figure 2: Cooling Systems & Flexibles Factory. Photograph by Jeremy San. CC-BY-SA 3.0 IGO

limit views of surrounding heavy industry, relying on clerestory windows for daylight. The factory is historically significant not only for its role in diversifying Singapore's industrial economy but also for its intangible associations with early migrant entrepreneurship, worker welfare initiatives, and design excellence in Jurong's industrial landscape. It represents a pioneering moment where industrial production, architectural ambition, and social modernisation converged.

Period(s) of operation
September 1971 - Present

Key events/chronology and changes to relevant attributes
The Cooling Systems and Flexibles factory opened in September 1971 as Singapore's first Indian-owned factory and the nation's pioneer auto spare parts plant. Established by Bombay-based Teksons, it produced radiators, hoses, and couplings, quickly reaching export markets in over 30 countries and expanding to more than 70 by 1979.

Designed by Architectural Design Group, the factory's defining features included a massive projecting roof slab on tapering columns, a bronze-tiled entrance wall, sawtooth roof, and perforated concrete screens for light and ventilation. It was also notable for its progressive staff

welfare provisions, becoming the first Singapore factory with a basement canteen, complemented by sports facilities and an open-plan office.

During the 1980s, operations were affected by shifts in the global automotive sector and increasing competition. While its industrial use continued, parts of the interiors and welfare facilities were altered or diminished. Despite these changes, the essential external form and architectural character have remained intact.

Status of the research and historical documentation
Research on the Cooling Systems and Flexibles factory is minimal. The only known published account is Jason Ng's essay Industrial Heritage II – Power Stations and Jurong Industrial Estate (Docomomo Singapore, 2022), which briefly situates the factory within Jurong's early industrial landscape. Beyond this, documentation is very limited, and it remains unclear whether dedicated studies, archival surveys, or oral histories exist. The availability of surviving records such as architectural drawings, business files, or company archives is likewise unknown and requires further verification.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). Extant information suggest that the building has retained its original tenants and function. It remains largely intact and operational.

Known threats
The Cooling Systems and Flexibles Factory is situated on a plot designated for 'Business' land use in the URA Master Plan 2019. As both the building and the plot it is situated upon are not gazetted for conservation, it does not benefit from legal protection and thus remains susceptible to change, or expungement brought about by future development plans. In addition, the shorter leases attributed to business/commercial plots (as opposed to residential plots) add developmental pressure on the historic site.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.

Registration status in the national or local inventory
No.

Ownership
The site is currently being occupied by Cooling Systems and Flexibles Pte Ltd.

Local contacts
Docomomo Singapore (DocomomoSG)



Figure 3: Cooling Systems & Flexibles Factory. Photograph by Jeremy San. CC-BY-SA 3.0 IGO

Singapore Time Pte Ltd (Seiko Factory)

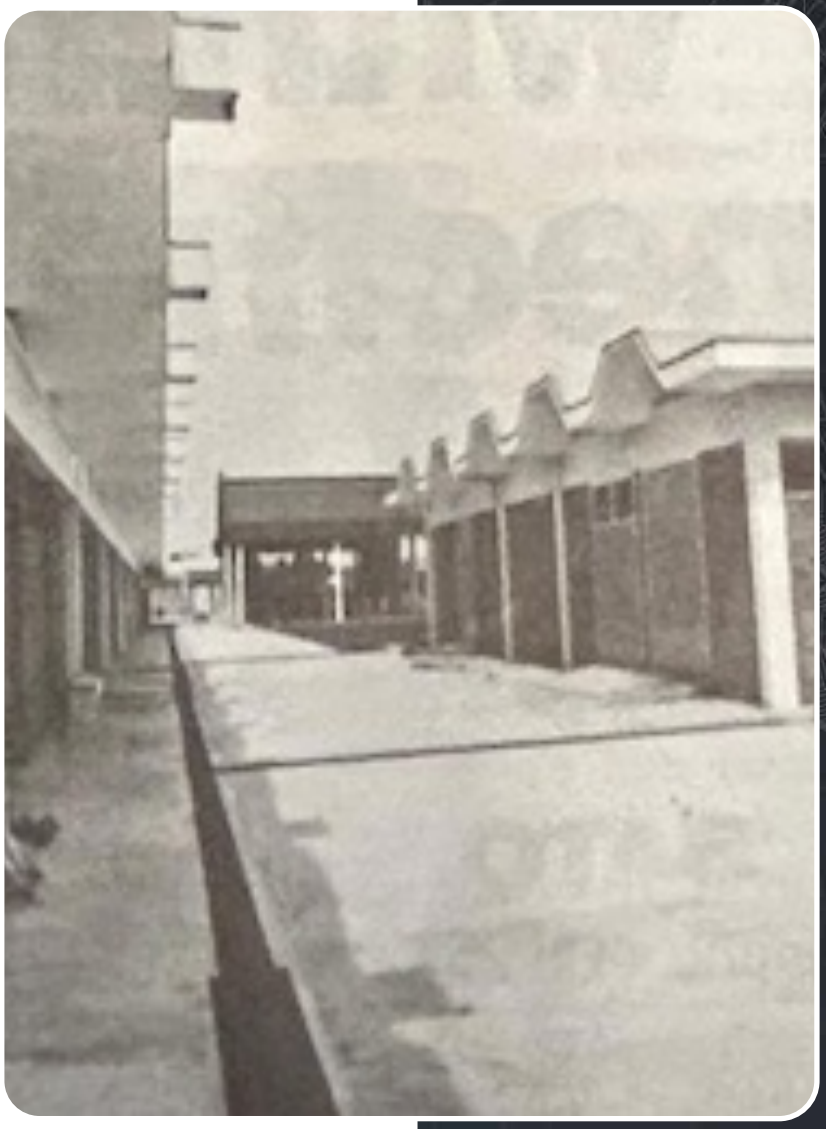


Figure 1: Seiko Factory. Source: *Building Materials & Equipment, Singapore, c.1974–1978*, Trend Publishing. Photographer uncredited in original publication

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

Industrial classification
Engineering
Industrial Communities
Precision Manufacturing;

Further details on the industrial classification
The site represents Singapore's move from heavy industries to light precision manufacturing in the 1970s. Established by Japanese multinational Daini Seikosha (Seiko), it specialised in watch movements and precision components for the global market. Beyond its role in export manufacturing, it anchored a strong industrial community in Woodlands New Town, supported by welfare facilities and recreational spaces.

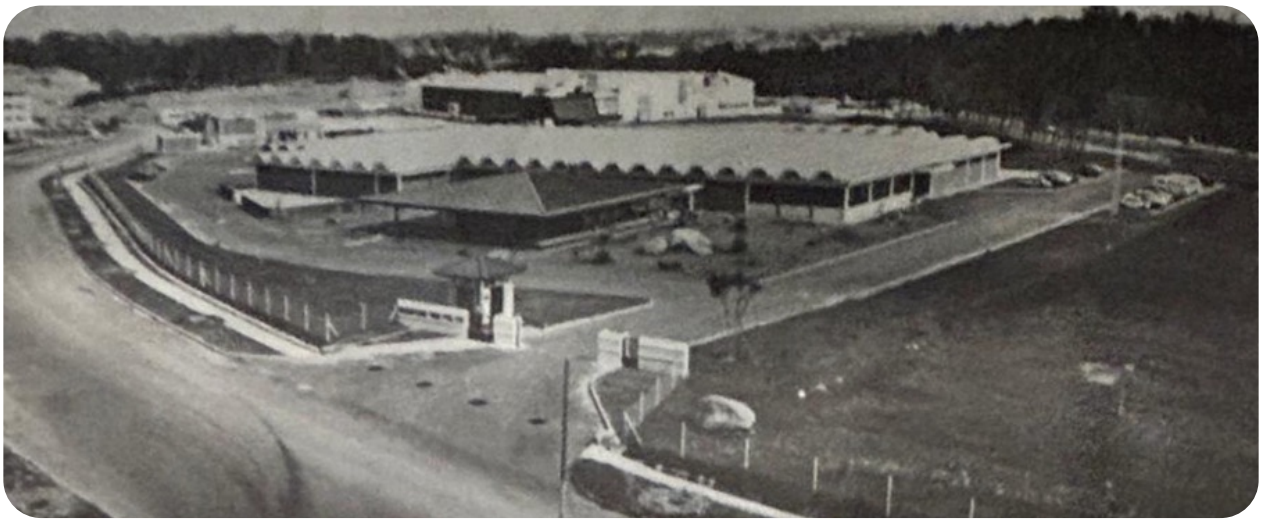


Figure 2: Seiko Factory. Source: *Building Materials & Equipment, Singapore, c.1974–1978*, Trend Publishing. Photographer uncredited in original publication

Brief description
Singapore Time Pte Ltd, later renamed Seiko Instruments Singapore (SIS) in 1988, was established in 1974 as a wholly owned subsidiary of Japan's Daini Seikosha. The $21 million factory in Marsiling Industrial Estate marked Singapore's transition from heavy industries to light industries producing high-value, precision consumer goods. Officially opened by Prime Minister Lee Kuan Yew in March 1976, the factory symbolised the country's successful industrial diversification strategy and its ability to attract foreign multinationals.

Architecturally, the factory is notable for its innovative design by Archiplan Team, Singapore. Its 22-metre large-span post-tensioned roof adopts a striking folded-concrete form, serving both structural and aesthetic functions. The roof's valleys also doubled as efficient drainage gutters, while fair-faced brick walls expressed a modern, industrial character. Beyond its production spaces, the factory incorporated extensive staff facilities including a canteen, football and netball fields, and a clubhouse. thus reflecting progressive approaches to worker welfare.

Functionally, the factory specialised in the manufacture and assembly of both mechanical and quartz watch movements, as well as precision components for the global market. To launch operations, 89 Singaporean employees were trained in Japan, embedding advanced skills in precision engineering and mass production. This transfer of knowledge represented a major step in building Singapore's skilled workforce, moving the economy beyond bulk, low-value manufacturing into specialised industries.

Intangibly, the Seiko factory reflects the cultural and technological exchange between Singapore and Japan during the 1970s. It represents the lived experience of workers in a 'new town' industrial estate, where housing and industry were deliberately co-located to foster vibrant communities. As a pioneering site of precision manufacturing, it stands as testimony to the industrial and social aspirations of post-independence Singapore.

Period(s) of operation
1974 – Present.

Key events/chronology and changes to relevant attributes
Since its establishment in 1974, the factory has remained in continuous use as a watchmaking and precision manufacturing centre. Architecturally, the site has undergone little change: its distinctive folded-concrete roof, fair-faced brick walls,

and overall form remain intact, though internal spaces once designed as large open-plan production floors have been subdivided to accommodate evolving processes. Functionally, the greatest changes are technological shifting from manual assembly to advanced precision machining, injection moulding, and surface treatment. This was to ensure competitiveness in the global market. The factory's role has thus adapted to new demands while retaining its original character as a landmark of Singapore's industrial diversification.

Status of the research and historical documentation
Research and documentation on the former Singapore Time Pte Ltd (later Seiko Instruments Singapore) is limited. Historic photographs, the factory's opening speech, and press coverage are available in the National Archives of Singapore. A January 1976 article in Building Materials and Equipment magazine documented its architectural and industrial features. More recently, OGS (Our Grandfather Story) produced short documentary films with oral history interviews of current and former workers, offering insights into daily life at the factory.

Beyond these, dedicated academic studies, conservation surveys, or corporate archival records remain scarce. While some business documents may exist within Seiko's internal archives, these are not publicly accessible. Oral histories of long-serving employees and architectural drawings may be held in closed-stack collections, but their extent is unclear.

Current status and state of conservation
The factory building remains standing and its exterior is highly intact, with the distinctive folded concrete roof, brick walls, and structural form well preserved. No records confirm whether original machinery or interiors survive, though photographs suggest alterations to internal spaces are likely. The site continues in industrial use, but detailed information on current operations is limited.

Known threats
The site has no formal conservation status and thus faces potential risk from redevelopment or alteration. While the exterior remains intact, its long-term protection is uncertain, as no measures have been put in place to safeguard its architectural or industrial heritage significance.

Protection status
None.

Registration status in the national or local inventory
None.

Ownership
SEIKO Manufacturing (Singapore)

Prima Flour Mill



FIGURE 1: Prima Flour Mill. Ordinance. Source: Studio Lapis. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

Industrial classification
Food & Drink Processing

Further details on the industrial classification
The site is classified under Food & Drink Processing as it has functioned continuously as a flour mill since 1963, producing wheat flour and related by-products for domestic consumption and export. It also represents an important industrial community, employing generations of local workers and symbolising Singapore's early diversification into modern manufacturing under the Pioneer Industries Ordinance.

Brief description

The Prima Flour Mill, completed in 1963 and officially opened in 1964, is Singapore's first and largest flour mill, established under the Pioneer Industries Ordinance of 1959 to address high unemployment and diversify the economy beyond entrepôt trade. Its founding signalled the government's early industrialisation drive, with Prima Ltd. investing $10 million to construct a modern milling complex along Keppel Road. Strategically sited next to Keppel Harbour, the mill was designed for efficiency, with bulk carriers able to discharge wheat directly into its concrete silos. At its inception, it had a milling capacity of 230 tonnes per day and a storage capacity of 20,000 tonnes, rapidly expanding to 700 tonnes per day to meet export demands.



Figure 2: Prima Flour Mill. Source: Studio Lapis. CC-BY-SA 3.0 IGO



Figure 3: Prima Flour Mill. Source: Studio Lapis. CC-BY-SA 3.0 IGO

Architecturally, the mill exemplifies modern industrial functionalism. The cluster of reinforced concrete silos, cylindrical in form, embodied the principles of durability, maximum storage capacity, and minimal material use. Their verticality became a new landmark on Singapore's southern waterfront, symbolic of the transition to heavy industry. The addition of the Prima Tower Revolving Restaurant in 1977 further cemented its landmark status, turning an industrial facility into a celebrated social icon. Perched atop the silo complex, the revolving restaurant, Asia's first, hosted weddings, banquets, and community celebrations for over four decades, before closing in 2020.

As Singapore's only surviving flour mill, Prima is both technologically and socially significant. Intangibly, it represents the aspirations of the Pioneer Industries era, the skills of generations of factory workers, and collective memories tied to both the workplace and the restaurant. It remains a rare, intact example of a modern concrete flour mill typology in South-East Asia and a highly symbolic site in Singapore's industrial and cultural history.

Period(s) of operation

1963 – Present but set to move its operations between last quarter of 2026 and 1st quarter of 2027

Key events/chronology and changes to relevant attributes

The Prima Flour Mill was constructed between 1961 and 1963 under the Pioneer Industries Ordinance and officially opened in 1964 as Singapore's first and largest flour mill. Initially producing 230 tonnes of wheat per day, its capacity expanded to 700 tonnes within a year to meet growing export demand. In 1977, the addition of the revolving restaurant atop its silos cemented the mill as both an industrial and cultural landmark. Remarkably, the mill remains in operation today, its processes and functions largely unchanged. The original silos, milling

block, and tower continue to define the southern waterfront, and the site has undergone little alteration over time. As such, Prima is a rare example of a modern flour mill that has retained both its industrial role and architectural integrity, standing as a living marker of Singapore's early industrialisation.

Status of the research and historical documentation
Research and documentation on Prima Flour Mill remain relatively limited. Most published material focuses on the Prima Tower Revolving Restaurant as a social landmark rather than the mill itself. Available sources include Reminiscing the Revolving Rides: Prima Tower Revolving Restaurant (Heritage.sg, 2021), Our Milestones & Firsts (Prima Group, 2019), and heritage-related blog accounts (The Long and Winding Road, 2024). These provide some context on the site's symbolic value, corporate history, and community memories, though not detailed technical studies of the mill's architecture or operations.

A preliminary architectural assessment was undertaken in a 2023 advisory report prepared by Studio Lapis for Mapletree, covering conservation considerations. Additional archival records may exist within company holdings (Prima Group business records, photographs, product catalogues) but are not publicly accessible. Oral history resources are also likely but remain uncollated. Overall, while some documentation exists, scholarly research on the mill as an industrial site is still limited.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). However, authorities are studying the area's structures and buildings to see if they have the potential to enhance the future development's character as part of the upcoming redevelopment of Singapore's city ports as part of the Greater Southern Waterfront.

Known threats
While specific plans for Tanjong Pagar and Keppel terminals, which is where the Prima Flour Mills are situated have not been fully revealed, Pulau Brani is set to be turned into a tourist destination under the Sentosa-Brani masterplan. In addition, Prima's lease with Mapletree expires in April 2027 and the mill's operations will be shifted to Jurong Port between the last quarter of 2026 and first quarter of 2027.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, it does not have any form of protection from the local or national government.

Registration status in the national or local inventory
None.

Ownership
Prima Limited.

Local contacts
Studio Lapis
Contact Person: Mr. Weng Hin, Principal Director
Website: www.studiolapis.sg

Lee Rubber Godown at Geylang Bahru



Figure 1: Lee Rubber Warehouses at Geylang Bahru, aerial. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

Industrial classification
Transport

Further details on the industrial classification
The site served as storage/ distribution in the rubber commodity chain rather than primary processing, leveraging river-road connectivity at Geylang Bahru/Kallang.

Brief description

Founded in 1931, Lee Rubber was a pivotal player in a commodity that underwrote much of the Malaya–Singapore economy. Singapore itself produced little rubber; its strength was as a hub for trading, finance, processing, and distribution. Smoked sheets and latex arrived from Malayan plantations by FMSR rail via the Causeway and by coastal craft, were milled and graded, warehoused in riverside godowns along the Singapore and Kallang corridors, then exported to global consumers through the port. The Lee Rubber godown at Geylang Bahru sits squarely in this chain.

Singapore's rivers formed a two-track logistics ecology. Singapore River was the mercantile 'front of house'—trading houses, banks, agents, lighterage, contracts, paperwork. Kallang River was the industrial 'back of house': sawmills, yards, heavier trades, and crucially river access for bulk, low-value cargo with direct transfer to road haulage. Shallow-draft tongkang (small boats) brought rubber bales on the tide to ramps and loading bays; goods were weighed, staged and craned onto lorries along Geylang Bahru. Even as containerisation shifted blue-water shipping to PSA terminals in the late 1960s–70s, Kallang's river-to-road nodes, like this godown, remained efficient staging points.

After a major 1951 fire that gutted many stilt and attap structures along this stretch of the Kallang, the rudimentary sheds were replaced with modern, fire-resistant warehousing; the Lee Rubber complex was likely rebuilt in the late 1950s as part of that upgrading.

Built by Kumpulan Akitek, the ensemble reads as robust industrial modernism: fair-faced brick façades articulated by repetitive loading bays, and a run of octagonal end-forms with projecting ventilator stacks that cut a distinctive silhouette along the water. The repeated



Figure 2: Lee Rubber Warehouses at Geylang Bahru. Source: Kempulan Akitek brochure



Figure 3: Lee Rubber Warehouses at Geylang Bahru, interiors. Source: Kempulan Akitek brochure

octagons likely served ventilation and internal circulation, lending coherence to a utilitarian group designed for throughput and durability rather than display.

Period(s) of operation

Older rudimentary warehouses likely present from the 1930s, current structures date from the 1950s, site is still likely still functioning as a rubber warehouse.

Key events/chronology and changes to relevant attributes

Lee Rubber Co., incorporated in 1931, grew with the region's rapid expansion in rubber planting, processing and trade, maintaining godowns in the wider Geylang area by the 1950s (e.g., Lorong 3). After a major 1951 waterfront fire that gutted many stilt and attap structures along the Kallang, the firm likely rebuilt at Geylang Bahru in the late 1950s with modern, fire-resistant brick warehousing.



Figure 4: Lee Rubber Warehouses at Geylang Bahru, aerial. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

The 1970s development of Geylang Bahru as a new-town/industrial fringe—with serviced plots and better road links—further anchored the site as a river-to-road logistics node. By 1992, Lee Kip Lin's photographs document multiple Lee Rubber sheds and an office on the Kallang riverbank, confirming its operational footprint. The complex still stands; externally it appears largely intact, but current use, ownership details, and interior fabric require verification.

Status of the research and historical documentation
Documentation is very limited. Publicly accessible evidence comprises 1992 photographic records (Lee Kip Lin collection) showing the warehouses and office, including river-edge context. Company-level histories confirm Lee Rubber's long-standing operations but do not list this site specifically. Potential holdings (not yet pulled): PUB/JTC planning files for Geylang Bahru industrial plots, land/title records, and business directories; possible company records in private custody. No measured drawings, fabric survey, or oral histories identified for this site. It is highly recommended to conduct further investigations into its history and current state

Current status and state of conservation
None.

Known threats
The godown has no statutory conservation status, leaving it vulnerable to redevelopment pressure along the Kallang corridor. If under-used, vacancy and deferred maintenance (roof leaks, brick spalling) could hasten decay and loss of original fittings.

Protection status
None.

Registration status in the national or local inventory
None.

Ownership
Likely Lee Rubber Co. (Pte) Ltd

Pasir Panjang Power Station



Figure 1: Pasir Panjang Power Station. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

Industrial classification
Energy
Infrastructure
Industrial Communities

Further details on the industrial classification
Pasir Panjang Power Station played a crucial role in powering post-war Singapore and Singapore's intensive industrial drive in the 1960s. Commissioned in July 1953, it complemented the operations of the former St James Power Station (c. 1926) to generate greater capacities of electricity in tandem with the country's burgeoning economic activity. A new station on the same site, Pasir Panjang 'B' Power Station, was added in 1965 to supplement energy demand along with the older 'A' station.

Brief description
Pasir Panjang Power Station, completed in 1953, was Singapore's second major power station and a linchpin of its post-war industrialisation drive. Commissioned in record time the first generator was installed within just 23 months. It was officially opened in July 1953 by Governor Sir John Nicoll. Its output helped power the island's intensive industrial drive of the 1960s, meeting a national demand of 105.7 megawatts by 1962, a dramatic increase compared to St James Power Station's original 2 megawatts in 1926. To keep pace with this demand, a second plant, Pasir Panjang 'B', was added on the same site in 1965.

Designed by Municipal Architect Donald Cameron Rae, the power station embodies the utilitarian modernism of its era while displaying refined architectural touches. Its fair-faced red brick façade is punctuated by gridded square windows with concrete trimmings, soaring glazed turbine halls lined with vertical fins to soften the glare, and distinctive porthole windows, possibly a nod to the maritime setting at Keppel Harbour or to the Streamline Moderne fascination with ocean liners. These elements combine functionality with symbolic gestures of modernity.

Nearly two million locally made bricks and imported steel went into its construction, reflecting both post-war shortages and global supply chains. The cavernous turbine halls and fair-faced brick detailing remain intact today, a testament to both engineering and architectural resilience. Though decommissioned in phases ('A' in the mid-1980s, 'B' in the late 1990s), the complex remains one of Singapore's most intact post-war industrial landmarks. Pasir Panjang 'A' has since been adapted as a mixed-use entertainment space, while the larger site has been gazetted as part of the Greater Southern Waterfront, ensuring that this 15-hectare industrial icon continues to serve as a powerful marker of Singapore's transition from colonial utility to modern urban redevelopment.

Period(s) of operation
Completed in 1953, decommissioned in 1980s and late-1990s.

Key events/chronology and changes to relevant attributes
The commissioning of Pasir Panjang Power Station in 1953 represented Singapore's post-war recovery and was hailed as a symbol of modernisation. Its rapid completion within 23 months showcased both urgency and engineering ambition. Through the 1950s and 60s, additional generators were installed to keep pace with rising industrial and domestic demand, culminating in the construction of Pasir Panjang 'B' Station in 1965. Both stations operated as the backbone of the grid during the nation's early industrialisation drive. By the 1970s, new technologies and larger, cleaner stations such as Senoko gradually reduced reliance on Pasir Panjang. 'A' was decommissioned in the mid-1980s and 'B' in the late 1990s, though the distinctive red-brick facades, turbine halls, and architectural details remained largely intact. The site has since entered adaptive reuse, with 'A' repurposed for cultural functions while retaining its industrial character, ensuring continuity of form even as its operational role shifted.



Figure 2: Pasir Panjang Power Station. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Status of the research and historical documentation
Current scholarship on Pasir Panjang Power Station is limited. The clearest synthesis is a DOCOMOMO Singapore essay that foregrounds its post-war significance (Ng, 2022). Rich primary material likely exists in the National Archives of Singapore—City Council/ Municipal Engineer files, photographs, plans, and opening-day records—as well as Colonial Office correspondence and local newspapers; however, these have not been located, retrieved, or compiled for this nomination. No comprehensive architectural fabric survey or plant/machinery inventory has been published. Adaptive-reuse material (e.g., operator brochures for PPPS 'A') and URA Greater Southern Waterfront planning documents provide contextual updates but not building-level analysis. Overall, documentation remains fragmented, largely in English; a targeted archival pull and measured-drawings study are recommended.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). The building is largely intact even though it is no longer in operation presently.

Known threats
While Pasir Panjang Power Station is not formally gazetted as a Conserved Building or National Monument, it has been gazetted by URA as an important part of the Greater Southern Waterfront masterplan. URA had launched the 'Power-Up Pasir Panjang' ideas competition in 2019 to garner public and professional imaginations of repurposing the former power station.



Figure 3: Pasir Panjang Power Station. Photograph by Darren Soh. CC-BY-SA 3.0 IGO



Figure 4: Pasir Panjang Power Station. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government. The lack of legal protection lends the site to greater susceptibility to detractive alterations.

Registration status in the national or local inventory
No.

Ownership
State-owned, Singapore Land Authority (SLA).

Local contacts
Docomomo Singapore (DocomomoSG)
Website: www.docomomo.sg

Telok Blangah Substation



Figure 1: Telok Blangah substation. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

International Desigantion
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

Industrial classification
Energy; Infrastructure; Industrial Communities



Figure 2: Telok Blangah substation. Photograph by Darren Soh. CC-BY-SA 3.0 IGO

Brief description

The Telok Blangah Substation, designed by local pioneer firm Kumpulan Akitek, was a crucial piece of early infrastructure within the Telok Blangah public-utilities cluster, developed in the early 1970s to launch Telok Blangah New Town. A 66 kV sub-transmission node, it steps power from the high-voltage grid to local distribution for homes, commerce and light industry. Completed in 1974, it formed part of PUB's late-1960s/early-1970s distribution build-out, supported by international financing to expand capacity and reliability as new satellite towns came on stream. Architecturally, it is an unusually refined utility building. A bronze-anodised aluminium curtain wall, alternating solid and perforated panels with large glazed bays, wraps a rigorously planned equipment core. Thus giving it an office-grade modernist façade to a utilitarian plant. The work was recognised as architecturally distinguished in RUMAH: Contemporary Architecture of Singapore (1981), standing in productive contrast to Kumpulan Akitek's contemporaneous civic/residential landmarks (e.g., Subordinate Courts, Highpoint Apartments).

The substation and allied utilities exemplify a national effort to push power, water and sewerage to the urban fringe, enabling planned townships. Telok Blangah New Town, envisioned for roughly 70,000 residents, is a textbook case of coordinated, up-front utilities delivery underpinning Singapore's westward urban expansion. The site is a testimony to the intersection of infrastructural foresight, international financing, and local architectural expertise that drove post-independence urban and economic growth. While plant and controls have been renewed over time, the original massing and façade composition remain legible, and the substation continues to perform its original role.

Period(s) of operation

1974 – Present.

Key events/chronology and changes to relevant attributes
Conceived within PUB's early-1970s 66 kV expansion to serve Telok Blangah New Town and the southern corridor, the substation was completed and commissioned in 1974, providing the sub-transmission backbone for nearby housing, port and industrial users. Through the 1980s–2000s, the installation was progressively modernised where its equipment has been likely renewed, protection and control systems updated, and layouts adjusted to improve reliability and safety. Operations continued without interruption.

From the 2010s, periodic upgrades have kept the plant aligned with contemporary grid standards and security requirements. These interventions have been largely internal.

Externally, the building retains high integrity: the bronze-anodised aluminium curtain wall, the alternating solid/perforated panels, full-height glazing and original massing remain legible. Functionally, it continues to operate as a 66 kV sub-transmission node; there has been no change of use. Overall, the site has seen substantial plant upgrades

Status of the research and historical documentation
Documentation is scant and dispersed. Public sources note the 1974 completion and early curtain-wall treatment; there is no dedicated study, measured drawings set, or plant inventory. Technical records (as-builts, relay schedules, SCADA/upgrade files) likely sit in PUB/SP Group archives and are not publicly accessible. The National Archives may hold 1970s tenders, plans, correspondence, and photos, but these have not been compiled. World Bank reports frame the era's 66 kV expansion without naming this site. No site-specific oral histories identified.

Preliminary assessments of the site and surrounding landscapes is available in a closed in progress report by Studio Lapis commissioned by the State.

Current status and state of conservation
The site is not formally gazetted for conservation by the Urban Redevelopment Authority (URA) and/or Preservation of Sites and Monuments (PSM). Extant information suggest that the building has retained its original tenants and function. It remains largely intact and operational.

Known threats
Telok Blangah Substation is situated on a plot designated for 'Utility' land use in the URA Master Plan 2019. As both the building and the plot it is situated upon are not gazetted for conservation, it does not benefit from legal protection and thus remains susceptible to change, or expungement brought about by future development plans.

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.

Registration status in the national or local inventory
No.

Ownership
The property is currently operated by the SP PowerGrid Ltd.

Local contacts
Studio Lapis Conservation Pte Ltd
Contact Person: Mr. Weng Hin, Principal Director

Shell-Bukom's Clubhouse/ Residential Complex



Figure 1: Pulau Bukom, a worker's dormitory. Photograph by Finbarr Fallon. CC-BY-SA 3.0 IGO

Contributors:
Ho Weng Hin
Jaclyn Chua Xinhua
Adrain Han
Studio Lapis

State, Province, Region
Singapore

International Desigantion
The site is not internationally recognised as significant under any global convention and programme related to the protection of cultural and natural heritage.

Industrial classification
Energy
Industrial Communities

Brief description
The Shell-Bukom Clubhouse and Residential Complex was designed by Iversen Van Sitteren & Partners for Messrs Shell Eastern Petroleum Pte Ltd, a subsidiary of the Royal Dutch Shell company that first established its presence in Singapore in 1861. The complex was built in 1977 to house workers of Singapore's first oil refinery on Pulau Bukom, a remote island that began operating as a refinery station in 1961. The Bukom refinery remains Shell's largest refinery globally and continues to operate today. However, the residential complex itself appears to have been disused for more than a decade.

Purpose-built to provide a pleasant living environment for Shell's staff, the S$20-million complex was conceived as a self-contained residential and recreational hub set against the island's heavily industrial landscape. It comprised a clubhouse complex, residential apartments, a swimming pool, tennis courts, a bowling alley, barbecue pits, a sauna, and even floating restaurants along the coast. Essential services such as a barbershop, tailor, restaurants, library, and theatre reinforced the company's progressive approach to labour welfare, reflecting a broader corporate ethos of multinational firms operating in Singapore's industrial era of the 1960s and 1970s.

The two main residential blocks were designed for different staff groups: a seven-storey block with 28 units for married personnel, and an eight-storey bachelor block with 16 units. The apartments were exceptionally spacious, up to 3,000 square feet, equipped with central air-conditioning and six toilets, and afforded panoramic sea views.

Architecturally, the complex stands out for its contrast against the surrounding refinery structures. Constructed primarily of fair-faced clinker bricks with tiled roofs, the ensemble evokes warmth and domesticity. The clubhouse and restaurant



Figure 2: Pulau bukom, recreational complex, 1977. Source: The Construction Times, Singapore, 1977, Times Communication. Photographer uncredited in original publication

structures feature deep eaves for shade, open ground-floor plans for ventilation, and distinctive octagonal roof forms that extend over floating platforms, creating visual and spatial integration with the sea. The design expresses the language of tropical modernism, with adaptations such as open plans, deep eaves, and generous terraces with tiled finishes that lend a vernacular feel while maintaining climatic responsiveness.

Period(s) of operation
1977 – Present.

Key events/chronology and changes to relevant attributes
During its operation, the Shell-Bukom Clubhouse and Residential Complex underwent several key phases that shaped its historical and architectural significance. Constructed in 1977 by Iversen Van Sitteren & Partners for Shell Eastern Petroleum, the complex reflected the company's progressive labour welfare policies of the 1970s, providing modern, resort-like accommodation and recreational amenities for refinery staff. Through the 1980s and 1990s, the complex remained in active use, well maintained, and emblematic of corporate community living within an otherwise industrial landscape.

From the early 2000s, however, changes in refinery management and automation led to a gradual decline in residential occupation and upkeep. By the 2010s, the clubhouse and apartments appeared to be largely disused, with visible deterioration in finishes, vegetation overgrowth, and the closure of ancillary facilities such as the pool and restaurants. Despite the physical fabric remaining largely intact, the loss of social use and daily maintenance has diminished much of its original character and associative significance.

Today, the complex stands as a rare architectural and social artefact of Singapore's industrial modernisation period, yet remains vulnerable due to its location on private industrial land without conservation protection.

Status of the research and historical documentation
Documentation is scant and dispersed. A publication on the construction of the complex has been published in 1977 with some photos and basic information. Technical records (as-builts) likely sit in archival records of Iversen Van Sitteren & Partners architect and are not publicly accessible. The National Archives may hold 1970s tenders, plans, correspondence, and photos, but these have not been compiled. One site-specific oral history is available online published by Mothership on the former residents of the site.

Current status and state of conservation
The site is not formally gazetted for conservation under the Urban Redevelopment Authority (URA) or the Preservation of Sites and Monuments (PSM) framework. Available information suggests that the building has been vacated for a considerable period, although no verifiable documentation currently confirms the exact date or circumstances of its disuse.

Known threats
Situated on privately owned industrial-zoned land, the Shell-Bukom Clubhouse and Residential Complex is not formally gazetted for conservation and therefore lacks

Protection status
As the site is neither a gazetted conserved site/building nor a National Monument, does not have any form of protection from the local or national government.

Registration status in the national or local inventory
No.

Ownership
Ownership of the Shell Energy and Chemicals Park in Singapore, including the Pulau Bukom refinery and likely the Shell-Bukom Clubhouse and Residential Complex, has been transferred to CAPGC Pte. Ltd. a joint venture between Indonesia's Chandra Asri Group (majority owner and operator) and global trading house Glencor on April 1, 2025.

Local contacts
Studio Lapis Conservation Pte Ltd
Contact Person: Mr. Weng Hin, Principal Director



Figure 3: Pulau Bukom, a worker's dormitory. Photograph by Finbarr Fallon. CC-BY-SA 3.0 IGO



Thailand

Contributor:

Rungsima Kullapat
National Representative, TICCIH
Researcher at the Carolina Asia Center,
University of North Carolina at
Chapel Hill, USA.

Thailand's Industrial Transformation

Thailand's industrial history is characterised by a gradual but decisive transformation from agricultural and extractive foundations to becoming one of the dynamic manufacturing hubs in South-East Asia. While it has achieved considerable growth, the future hinges on innovation, inclusive development, and environmental sustainability.

The history of industrial development in Thailand can be divided into six periods and key events, as follows:

- **1. Pre-Industrial Period (Before the 19th Century)**
  Industries were focused on the agricultural economy where Thailand (then Siam) had a predominantly agrarian industry, with rice farming as the main economic activity. Craft industries such as localised industries of pottery, textiles (silk and cotton), and boatbuilding flourished but were limited in scale and technological advancement. There was also metal industries of tin and copper. Maritime trade, particularly with China, India, and later European powers also existed during that time and it, brought foreign goods and technology but did not fundamentally industrialise the country.

- **2. Early Industrialisation under King Rama IV and Rama V (Mid-19th – Early 20th Century)**
  During the reign of King Mongkut (Rama IV) and King Chulalongkorn (Rama V), modernisation initiatives were introduced. Railways, telegraphs, and modern administrative structures were created. The first railways and ports radiating from Bangkok were created, and roads were built to support internal connectivity and exports. The tin and teak industries developed with in mining developing in the south (Phuket, Phang Nga, Ranong) while teak logging began in the north in places like Chiang Mai and Lampang and they were developed through concessions to foreign (especially British) companies. Limited local industries such as small-scale rice mills and sawmills emerged, but much of the industrial capital was foreign owned.



Figure 1: Thailand developed its first railways from 1896, and by 1916 had opened the Hua Lamphong terminus in Bangkok. It was designed by Italian architect, Mario Tamagno, who was based in Turin. Photograph by Supanut Arunprayote (2023). Source: Wikimedia Commons. CC BY 4.0

- **3. Interwar and Post-WWII Industrial Foundations (1920s–1950s)**
  After the 1932 revolution, the government began forming state enterprises in cement, paper, sugar, textiles, and tin. During this period, there was a rise in state enterprises. A strategy was developed to reduce reliance on imports. Thailand encouraged domestic production of consumer goods. In the 1940s–50s policies of investment controls were developed which aimed to nationalise or regulate key industries.

- **4. Rapid Industrialisation and Export-Oriented Growth (1960s–1980s)**
  During this period, national economic plans were developed and under the first National Economic and Social Development Plans, Thailand focused on infrastructure, education, and rural development to support industry. Shift to export-oriented industrialisation (EOI) occurred from the late 1970s, wherein Thailand transitioned to manufacturing for export, particularly garments, electronics, and auto parts. The establishment of industrial zones such as what is found in Thailand's Eastern Seaboard provided incentives from the Board of Investment (BOI) which attracted foreign direct investment, especially from Japan.

- **5. Industrial Diversification and Crisis (1990s–2000s)**
  The country pushed for diversification during this period wherein the industrial base expanded to include petrochemicals, automotive assembly, and electronics. At the time of the 1997 Asian Financial Crisis, the economy was hit hard, exposing weaknesses in overleveraged industries and currency policy. Reforms followed, including liberalisation and financial restructuring.

- **6.Current Trends and Future Directions (2010s–Present)**
  The country has developed its Thailand 4.0 Policy, a national strategy to move from labour-intensive industries to innovation-driven industries, focusing on robotics, biotech, smart electronics, and digital services. Hurdles still exist - there is an ageing workforce, income inequality, and deep dependence on foreign technology are seen as barriers. However, there's a growing interest in industrial heritage tourism such as a growing demand to visit tin mining towns, green industries, and places wherein sites are conscious with sustainable development that are aligned with global goals.



Figure 2: In 1913 the King of Siam invited F L Smith & Company of Copenhagen, Denmark, to established a cement factory at Bang Sue. This evolved into Siam Cement Company (later Siam Cement Group SGC), and was for a time the biggest cement factory in South-East Asia. This photograph is of SGC's TPI Polene Cement Plant. Photograph by Paul_012 (2023). Source: Wikimedia Commons. CC BY 4.0

From the above timeline, agriculture-based industries in Thailand have continued from the pre-industrial revolution era to the present day, differing only in techniques, tools, and methods used. Interestingly, some industries still employ primitive, traditional methods that remain popular and are valued as learning opportunities for the younger generation — such as hand-molding pottery, making salt at home from soil, or tin ore panning.

In terms of transportation, significant changes have occurred. Once known as the "Venice of the East" for its network of canals used for public travel and goods transportation, Thailand saw developments such as bridge construction that could open to allow large cargo ships to pass. Over time, water transport was replaced by roads and air travel, turning much former transport infrastructure into industrial heritage.

A key distinction between Thailand and other South-East Asian countries is that Western knowledge and technology were introduced through government-led initiatives. This was done by inviting European experts to work for the Thai government rather than colonial powers establishing factories or forcing local labour, as what has been observed in other parts of the region.

Transnational Connections

Thailand's industrial heritage is deeply linked to global networks through historical trade, transportation, and foreign investment. During the 19th and early 20th centuries, British, Chinese, and European entrepreneurs played key roles in developing Thailand's tin mining, teak logging, and infrastructure sectors. British companies secured concessions in tin-rich southern provinces like Phuket and Ranong, connecting Thai minerals to smelters in Penang and global markets via maritime routes. Teak from northern Thailand, extracted with British-backed technologies, was floated down rivers for export to British India and Europe. Chinese migration also shaped industrial communities, especially in mining towns, where secret societies and clan networks facilitated trade, labour, and temple-building. Railways, built from the late 19th century with Western engineering support, linked resource-rich interiors to ports, embedding Thailand in global commodity flows.

National Inventory or Database for the Country's Built Heritage

Thailand maintains a national inventory of its built heritage through the Fine Arts Department (FAD) under the Ministry of Culture. This inventory, established under the Act on Ancient Monuments, Antiques, Objects of Art, and National Museums, B.E. 2504 (1961), encompasses architectural sites (referred to as "ancient monuments"), antiques, and objects d'art of significant artistic, historical, or archaeological value. There is available online repositories found in the Fine Arts Department (FAD) under the Ministry of Culture and the Princess Maha Chakri Sirindhorn Anthropology Centre's Websites.

System of Statutory Protection for Built Heritage

Thailand has a statutory protection system for built heritage, primarily governed by the Act on Ancient Monuments, Antiques, Objects of Art, and National Museums, B.E. 2504 (1961). This legislation provides the legal framework for the conservation and management of the country's cultural heritage.



Figure 3: Chulachomklao Bridge, a railway bridge completed in 1916, since converted to road traffic. Photograph by Tamwnan (2014). Source: Wikimedia Commons. CC BY 4.0

National System of Statutory Protection for Built Heritage and the Inclusion of Industrial Heritage

While the Act provides a robust framework for the protection of traditional and historic sites, it has been noted that industrial heritage—such as historic factories, mines, and transportation infrastructure—is not systematically included in the national registry. This gap highlights the need for broader recognition and inclusion of diverse heritage types in Thailand's conservation efforts. In summary, Thailand's statutory protection system for built heritage is well-established, focusing on the preservation of sites deemed significant in art, history, or archaeology. However, expanding the scope to encompass industrial heritage remains an area for potential development.

Sustainability of the Recognised Industrial Heritage Assets and their Contribution to the SDGs

- SDG 8: Target 8.9: "Promote sustainable tourism that creates jobs and promotes local culture and products."
- SDG 12: Target 12.b: "Develop tools to monitor sustainable tourism."
- SDG 4: Target 4.7: "Ensure that all learners acquire knowledge and skills to promote sustainable development."

Earthenware Pottery Production – Thai-Khorat Process



Figure 1: Following partial drying, the potter closes and rounds the bottom of the preform, Ban Wang Tua, Khon Kaen Province. Source: Cort and Lefferts 1993-2015

Contributors:
Dr. Leedom Lefferts
Professor Emeritus of Anthropology, Drew University

Louise A. Court
Curator of Asian Ceramics Emeritus, National Museum of Asian Art, Smithsonian Institute

State, Province, Region
Northeast Thailand
Various locations (see attached list)

Industrial classification
Pottery
Extraction
Industrial Communities

Further details on the industrial classification
Agricultural & Fishing, Extraction, Industrial Communities, Transport

Brief description

Earthenware pottery production in Northeast Thailand is dominated by women using an embodied technology classified as Thai-Khorat (Cort & Lefferts Type A), which developed in and around the Non Sung, Non Thai, and Khong districts in Nakhon Ratchasima province and spread from there due to the efficiency of their household production. Prior to the coming of the railroad, Thai-Korat production also occurred along the eastward-flowing Mun River. The building of the railroad to the north, from Nakhon Ratchasima to eventually reaching Nong Khai, increased the area over which potters' households could expand and replace the less intensive Lao production system. We hypothesize that the Thai-Khorat production technology is a variant based on Khmer earthenware production as found in and near Kamphong Chanang and elsewhere in Cambodia and southern Vietnam.



Figure 2: Ban Wang Tua, Khon Keng Province. Source: Court and Lefferts 1993-2015

Type A earthenware production, as with all earthenware production, primarily depends on the skill and expertise of women; men often assist in mining, processing, and kneading raw clay and temper, but women complete the kneading process to their satisfaction in the early morning before beginning to form up to 20-30 pieces a day, usually ending in the early afternoon. The major tools in the preform production process are the hands and body motions of women.



Figure 3: Ban Mau, Mahasarakham Province. Source: Cort and Lefferts 1993-2015

Period(s) of operation

Pots are normally produced in the dry season, following the rice harvest from early January through until May, when rains start to fall and the humidity is too high for efficient drying of the produced 'greenware' pots.

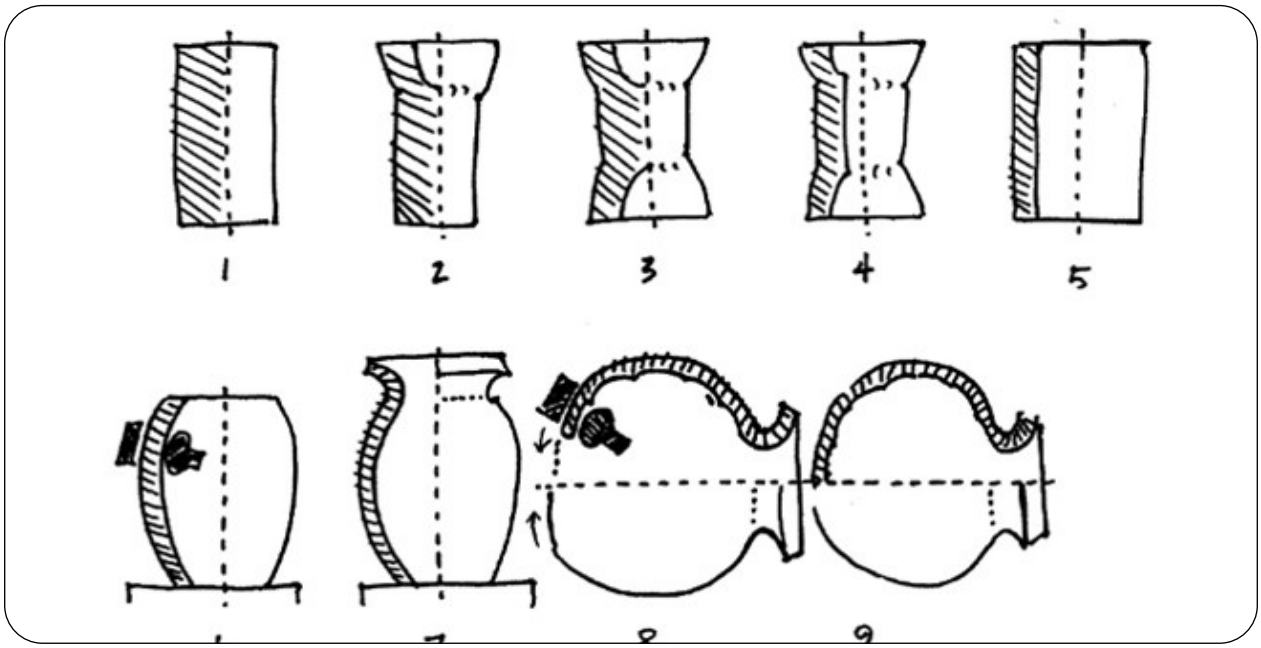


Figure 4: Schematic, Thai-Khorat production process, from Cort & Lefferts 2012, *Pots and How They are Made in Mainland Southeast Asia*. Transactions of the Oriental Ceramic Society (London), 75: pp. 1-15

Key events, chronology and changes to relevant attributes
Pre-1930's: expansion of Thai-Khorat potting households eastward along the Mun River1930's – 2000's: potting households expand from Nakhon Ratchasima Province throughout Northeast Thailand in a step-migration pattern, with households related by kin hiving off from ancestral households and moving to locations where this intensive, household based production technology could provide adequate income. (See Lefferts and Cort 1999 Women at the Center of an Industrialising Craft. Museum Anthropology 23(1): 21-32)

Status of the research and historical documentation related to the property
This production and its context has been extensively researched by academic professionals in Northeast Thailand: For a complete compendium of this work, see Leedom Lefferts and Louise Allison Cort Archives ANTAR.045624, *Yale University Peabody Museum of Natural History,* Sub-directory 10 RESEARCH BY OTHERS (1) – SEA Pottery Production, by location and site number and name.

In addition, Sub-directory 5 PRODUCTION SITES – by Country, documents all research undertaken by the author of this survey, including extensive photographic and video archives.

Current status and state of conservation
No conservation is currently underway to protect and continue this production process. The women who produce this pottery are acutely aware that this production is losing its market share due to replacement by refrigerators, metal ware, and plastic.

Known threats
Modern 'conveniences': refrigerators, metal ware (for cooking), and plastic containers.

Protection status
None

Registration status in the national or local inventory
None

Ownership
Local household women

Local contacts
Women in these communities

Makkasan Rail Depot



Figure 1: Makkasan Station. Photograph by Parinya Chookaew (2017). CC-BY-SA 3.0 IGO

Contributors:
Parinya Chukaew
Associate Professor, School of Architecture, Art, and Design, King Mongkut's Institute of Technology Ladkrabang

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

State, Province, Region
Thailand
Rachathewi, Bangkok

Industrial classification
Engineering
Transport

Further details on the industrial classification
The Makkasan Depot was Thailand's main facility for maintaining and repairing locomotives and rolling stock and for producing replacement parts. It also managed personnel, housing, welfare, finance, statistics, machinery, inventory, and property security. The site included the Burachatchayakon Hospital, workers' housing, and a station, providing accommodation, healthcare, and transport.

Brief description
The Makkasan depot comprises four main areas: The Makkasan workshop building, the Burachatchaiyakorn Hospital, the Makkasan Station, and the Makkasan Rail Workers' Housing. Each area has architecture with a notable history.

1. The Makkasan workshop building is used for repairing locomotives, rolling stocks, and producing replacement elements for the trains. The workshop also supplies regional repairing works, and is responsible for personnel management, housing welfare, accounting, finance, statistics, machinery, inventory, and security for the property.

2. The Burachat Chaiyakon Hospital, situated opposite the workshop, provides medical service for the State Railways' employees and families

3. The Makkasan Station is the 1st class station of the State Railway of Thailand. It consists of the station building, a signal box, and a series of employees' terraced houses. There is also the building of the Thai Labour Museum, which is recognised as a historic building.

4. The Makkasan Rail Workers' Housing is a large cluster of houses. A notable architectural feature is their elevated structure on concrete stilts, with an open basement, about 2.10 metres high. The hospital consists of two long two-storey buildings and 1 three-storey building.

Period(s) of operation
1914 - present

Key events/chronology and changes to relevant attributes
The State Railway of Siam built the Makkasan Depot to provide maintenance services, which were previously carried out at the Hualamphong Yard. The first and primary building was a locomotive depot in reinforced concrete, which officially opened in June 1910. Subsequently,



Figure 2: Bird's-Eye View Makkasan Depot. Photograph by Weeraphol Singnoi (2017). CC-BY-SA 3.0 IGO

additional lands were purchased, and the existing Makkasan Depot was expanded, with new buildings constructed to replace the old ones. A storage building, as well as a dining hall, an engineer's house, and a guardhouse, were built. The Workshop building, the State Railway of Thailand Vocational School, and the Workers' Housing were built in 1938, but remained incomplete due to the outbreak of World War II in 1941. The Makkasan Depot was damaged by air raids on four occasions. The State Railway of Thailand subsequently repaired the depot, completing these works in 1957.

The Burachatchaiyakon Hospital was built in 1950 to provide healthcare services for rail workers and their families, while the Rail Workers' Housing was completed in 1954 to extend accommodation services to the workers of the Depot. In parallel, the hospital and the housing units had been expanded to accommodate 651 families in total.



Figure 3: Makkasan Depot. Photograph by Weeraphol Singnoi (2017). CC-BY-SA 3.0 IGO

Status of the research and historical documentation
Banana Studio (2560) Co., Ltd., The Valuable Buildings in Makkasan Depot Area Survey for Conservation Project. Complete report to the Association of Siamese Architects Under Royal Patronage.

Ekkarat Sriarayanphong (editor), Parinya Chookaew, et al. (2021). 111 Anniversary of Makkasan Workshop. Bangkok: Amarin Printing and Publishing Co.

Current status and state of conservation
In 2013, the government published a development proposal for the Makkasan Workshop area, which entails a commercialisation plan. A campaign was formed under the name 'We want Makkasan to become a Public Park and Museum' on Facebook, submitting a petition to the government to reconsider the plan, but no further resolution has since been reached. In 2015, the government restarted the commercialisation plan a public-sector venture was formed under the name 'Makkasan Network'.

Known threats
At present, the potential for the creation of a commercialisation plan still exists, and envisions creating Bangkok's gateway and transport hub. The proposal foresees the development of several income-generating elements within the premises, such as shopping malls, exhibition halls, hotels, and office buildings. However, there's no clear direction for the conservation of the Makkasan Depot itself. Its future remains uncertain, and workers who currently live there face an uncertain future.

Protection status
Conservation Master Plan, Environmental Impact Assessment (EIA), Health Impact Assessment (HIA), and Heritage Impact Assessment (HIA) have not been completed.

Registration status in the national or local inventory
One of the buildings (i.e., Rolling Stock Maintenance Building, or '2465' Building) was listed by the Department of Fine Arts in 2023.

Ownership
The State Railway of Thailand (SRT)

Northeast Thailand Rock Salt Pit

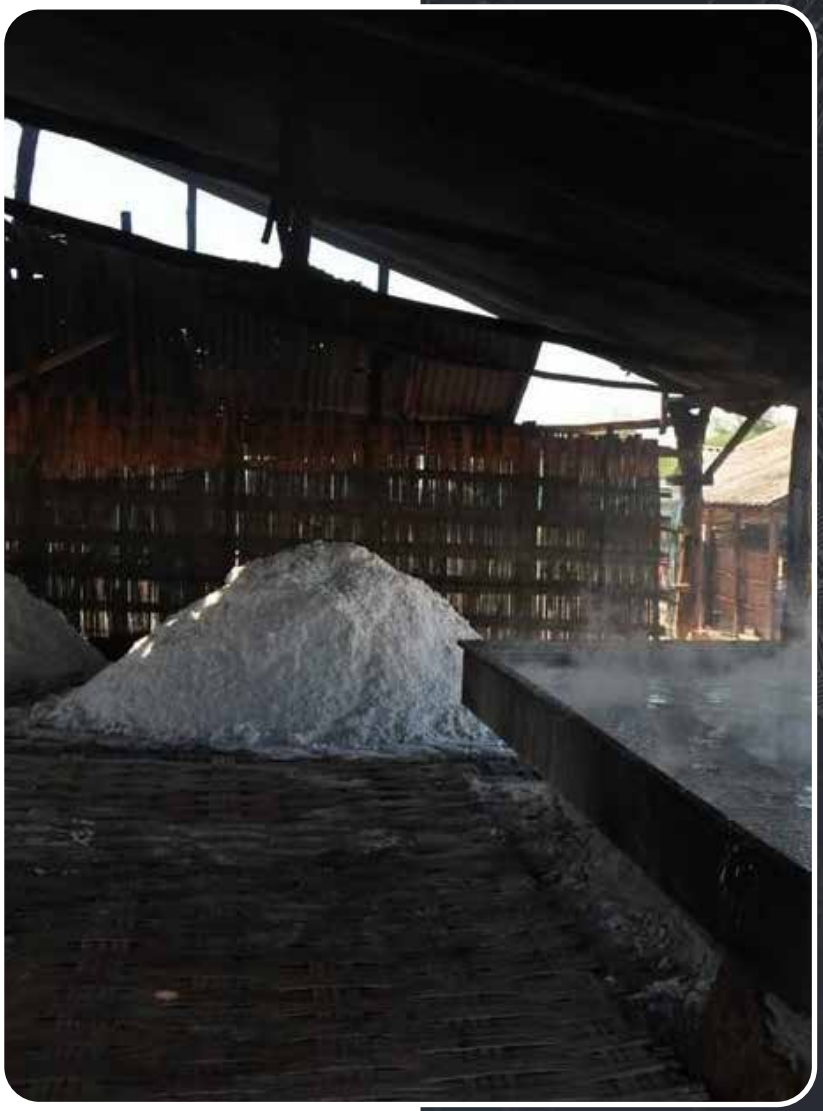


Figure 1: *Bo Hua Had, Bueng kan* (boiling the brine from Salt Well). Photograph by Amarit Muadthong (2018). CC-BY-SA 3.0 IGO

Contributors:
Amarit Muadthong
Assistant Professor of Architecture at Mahasarakham University

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

State, Province, Region
Thailand
Northeast Thailand

Industrial classification
Mineral Products

Salt sources are geologically correlated with subsurface salt dome (Salt Dome) formations, characteristically occurring in flood plain areas that are compatible with rice cultivation zones, or located adjacent to marshlands or riverine and stream systems.



Figure 2: *Bo Kathin, Khonkaen* (Scratching Saline Soil and boling the brine). Photograph by Amarit Muadthong (2018). CC-BY-SA 3.0 IGO

Brief description
This intangible heritage represents traditional wisdom in the management and administration of saline land areas and salt resource sites, including adaptive practices in response to seasonal variations of flooding and drought cycles. Additionally, sacred elements are inherent to salt production sites, requiring ritual ceremonies and offerings before commencing production activities. Production then continues until the flooding season arrives, whereupon communities transition to engage in other agricultural activities.

The production cycle commences after the rice harvest, around November and continues until before Songkran in April. Salt makers gather to produce salt at salt fields, using fresh water and saline soil to process the salt. They have salt boiling areas and rest areas where they spend their entire day producing.

Period(s) of operation
Salt production dates back to pre-historic times

Key events/chronology and changes to relevant attributes
Rock salt production has been practised since prehistoric times to the present, but in recent times, the replacement of clay pots with zinc sheets began in the 1950s, and these t continue to be widely used today.

A significant event in 1957 involved the drilling and pumping of saline groundwater to be sun-dried in a similar manner to sea salt production. This resulted in widespread damage to the soil in many areas, damaging nearby farms and crops, leading to protests demanding the ban.

The Ministry of Public Health announced that edible salt must contain at least 30 milligrams of iodine per kilogram and ruled that the production facility meets the

required legal standards. This prevented Isan rock salt from meeting consumer standards and from being officially labelled for distribution. Consequently, production and sales are limited only to small local groups. The subsequent growth of large-scale industrial salt producers, such as the Phimai Salt Factory, has led to a dominant position in the salt consumption market.

Status of the research and historical documentation
This consists of research studies and dissertations addressing ancient salt culture from archaeological, socio-cultural, and built environment perspectives:

Wilailak Songsiri (1995). Ancient Salt Production Sites and Pottery Kiln Groups in the Songkhram River Basin. Research Report.

Srisakra Vallibhotama (2001). *The Cradle of Isan Civilisation*, 4th edition. Matichon Publishing House.

Paiboon Boonchai and colleagues (2003). *Patterns of Natural Resource Utilization in the Chi River Basin*. Seminar Documentation, Graduate School, Silpakorn University.

Bampen Chairak (2011). *The Role of Salt in Cultural Ecology and Community Well-being in the Songkhram River Basin.*

Amarit Muadthong (2018). *Built Environment in Northeast Salt Culture* (Doctoral Dissertation in Philosophy Program).

Current status and state of conservation
Current threats include environmental changes surrounding production sites. In addition, the discourse surrounding saline soil problems adopts a one-dimensional perspective, lacking integration of historical and cultural landscape dimensions, thereby positioning salt sources as problematic from an economic crop development viewpoint. Another issue is the lack of scientific knowledge supporting production improvement, which remains focused solely on traditional production methods and temporary tourism promotion policies.

Protection status
There is no statutory protection. Survival is therefore reliant upon social protection enacted through the belief system centred on the spiritual guardians (Chao Pho and Chao Mae) of salt wells, underscoring communal resource ownership.

Registration status in the national or local inventory
None

Ownership
The local community is the custodian.

Siamese Canal System



Figure 1: The condition of the Rangsit Prayurasak Canal, c. 1937

Contributors:
Supradith Chitagon
Assistant Professor, Rangsit University

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

State, Province, Region
Thailand
Bangkok and its periphery

Industrial classification
Infrastructure

Further details on the industrial classification
Canal system

Brief description

The systematic excavation of canals was a key policy of Bangkok's administration, aimed at expanding arable land and facilitating agricultural production. This network also supported the region's role as a major supplier of raw materials and food to Europe, then the world's industrial hub, as well as to colonial territories of major powers. Such integration transformed the national economy and production systems, enabling rapid growth in export-oriented agriculture to meet foreign demand, in line with the expanding influence of imperialism across Asia.

The development can be divided into two major phases: first, the construction of canal networks to transport export-oriented produce from the western districts; and second, the expansion of canals to meet the growing global market demand, accompanied by land reforms and the establishment of land ownership.

At the same time, inexpensive machine-made imports from the West flooded into Siam, leading to the rapid decline of subsistence economies and traditional industries, and shifting production towards a market-oriented system. It symbolises the transition from being subsistence-based to an industrial and modernised economy. This was closely tied to major national reforms such as the abolition of slavery, an increase in the agricultural workforce, the establishment of land ownership systems, and the emergence of capitalist and labouring classes.

At present, the functional role of the canal network has diminished, serving primarily as the main drainage system for the central region. Nevertheless, many principal canals remain intact and continue to hold substantial historical and cultural significance.



Figure 2: The condition of the Chedi Bucha Canal during the reign of King Mongkut (Rama IV)

Period(s) of operation

The canal network in Thailand's central plains was initiated at the end of the 19th century and aimed primarily at transportation, except for the Mahasawat Canal, which was dug to support rice cultivation.

In the early 20th century, the rationale for canal construction shifted from a sole emphasis on transportation to a dual focus on transportation and the expansion of rice-growing areas.

Key events/chronology and changes to relevant attributes

In 1855, the Chedi Bucha Canal in Nakhon Chaisi and Nakhon Pathom was dug mainly for transporting sugarcane and sugar.

In 1860, the Mahasawat Canal, linking the Chao Phraya and Tha Chin rivers, was constructed and flanked by 16,200 rai of royal rice fields.

In 1866-1867, the Damnoen Saduak Canal and the Phasi Charoen Canal connected three major rivers to facilitate transport and sugarcane exports.

During King Chulalongkorn's reign, canal construction expanded cultivation areas, such as the Prem Prachakorn Canal (1869).

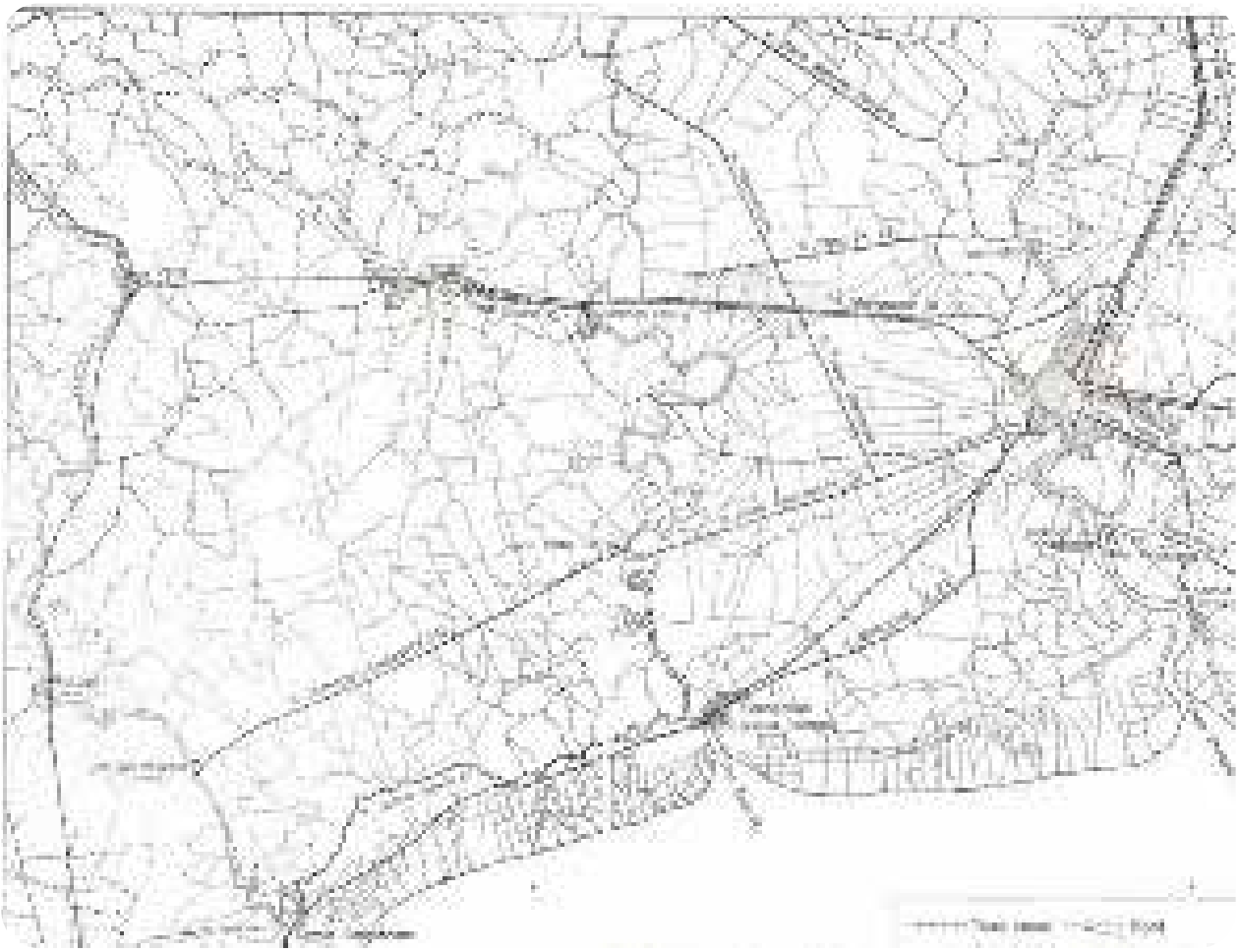


Figure 3: The canal network during the reign of King Mongkut (Rama IV)

The 1877 Canal Excavation Act required farmers to contribute funds or labour, with unused land repossessed by the state after five years. Between 1878 and 1903, six major state canals, along with several privately constructed canals, were added, many being used to transport teak.

The most significant project was the Rangsit Prayurasak Canal (1890) by the Siam Canals and Irrigation Company, which, along with 43 branch canals, created 840,000 rai of new farmland. In 1905, the Abolition of Slavery Act freed bonded labourers, integrating them into the agricultural workforce and supporting the expansion of commercial production.

Status of the research and historical documentation

Notable works include Historical Geography of the Canal System in the Chao Phraya River Delta by Shigeharu Tanabe, which examines the historical geography of the canal network in the Chao Phraya Basin. This study integrates technical and social perspectives, covering the period from the Ayutthaya Kingdom to the early Rattanakosin era. Another significant contribution is Historical Evolution of Bangkok (1782–1910) by Chunni Wu, which provides a detailed account of the development of Bangkok's canal network during the reigns of King Mongkut (Rama IV) and King Chulalongkorn (Rama V), with particular attention to political, economic, and transportation factors influencing canal excavation.

In addition, more focused studies on individual canals are also available. For instance, the online article King Rama V Permitted the Excavation of 'Khlong Rangsit' in the Northern Fields of Bangkok, an Area Once Home to Elephant Herds and Malarial-infested Forests by Wipa Jirapaisal documents the large-scale

irrigation project of Khlong Rangsit. It discusses concession agreements, state policies, and the promotion of canal construction for economic and agricultural benefits during the reign of King Rama V.

Current status and state of conservation
Oversight is provided by the Royal Irrigation Department, responsible for maintenance, restoration, and management of irrigation systems and waterways, and the Marine Department, which regulates dredging and navigation routes. Legal instruments, including the Canal Preservation Act (R.S. 121) and the National Environmental Quality Act, safeguard the network's structural integrity and environmental value.

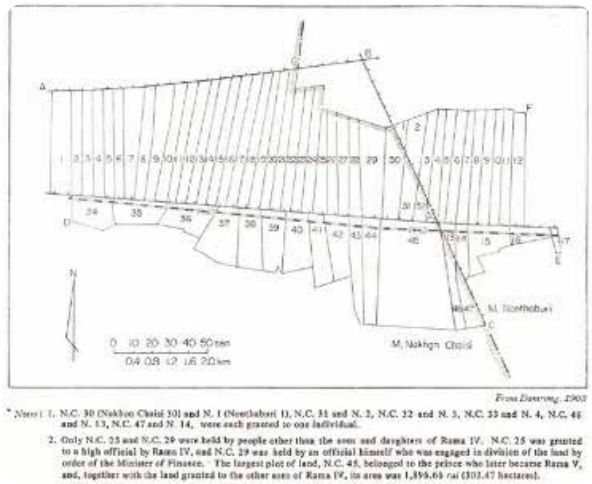


Figure 4: Historical land allocation map of both banks of the Mahasawat Canal, circa 1894



Figure 5: The Rangsit Prayurasak Canal System

Known threats
In certain areas, and at specific times, risks may arise concerning the landscape and environmental quality. These risks stem from uses that lack adequate awareness and a sense of responsibility for environmental conservation, which, if not properly managed, could negatively impact the site's historical, cultural, and ecological values over the long term.

Protection status
Canal Preservation Act (R.S. 121) and the National Environmental Quality Act

Registration status in the national or local inventory
There are laws for the conservation of rivers, canals, and waterways in terms of environmental aspects, but they are not specified in the context of heritage.

Ownership
The Office of the National Water Resources acts as the central authority on behalf of the State.

The 'Rahad' Waterwheels of Lamtakong



Figure 1: Structural configuration of the four-post waterwheel. Photograph by Narathip Thubthun (2014). CC-BY-SA 3.0 IGO

Contributors:
Narathip Thubthun
Associate Professor, Rajamangala University of Technology Tawan-ok, Thailand

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

State, Province, Region
Thailand
Nakhon Ratchasima Province,

Industrial classification
Agricultural & Fishing
Infrastructure
Irrigation

Further details on the industrial classification
The waterwheel was specifically designed to lift water to higher elevations, enabling the diversion of water from the main canal into an interconnected network of troughs and field channels for agricultural use. Its primary function—as a mechanism for the transport of water as a tangible resource—places it squarely within the domain of hydraulic infrastructure management.

Brief description
The Rahad waterwheels of Lamtakong are mechanised irrigation structures with a distinctive architectural form known locally as the 'four-post waterwheel', referring to the four vertical wooden posts that serve as the primary structural frame. A large wheel, affixed to this frame, functions to draw water from the Lamtakong Canal and lifts it to higher ground for agricultural use. The system operates by harnessing the kinetic energy of flowing water, whose pressure is intensified through the construction of a weir that raises the upstream water level. Water is released through a sluice gate, where it strikes the bamboo vanes of the wheel, causing continuous rotation. Bamboo cylinders tied to the wheel scoop water upward and discharge it into troughs, ditches, or pipes that transport it to the rice fields.

The Rahad played a pivotal role in resolving the physical limitations of the upper and middle reaches of the Lamtakong Canal, where deep waterways, steep banks, and undulating upland terrain made conventional rice cultivation difficult. These conditions, which were unsuitable for floodplain agriculture, hadpreviously hindered both farming and settlement. The introduction of waterwheels enabled the diversion and elevation of canal water to higher fields, thus making it possible to expand paddy cultivation and establish sustainable agrarian communities along the canal corridor.

Period(s) of operation
Since the early 19th century, these waterwheels have been used continuously for agricultural purposes across generations.

Key events/chronology and changes to relevant attributes
Early 19th century – Large-scale resettlement of Thai-Korat, Tai Yuan, and Tai Lao communities into the mid-Lamtakong basin marks the earliest evidence of Rahad waterwheel construction as part of vernacular irrigation infrastructure.

1969–1974 – The construction of the Lamtakong Dam submerged upstream communities and numerous waterwheels. Controlled downstream water discharge now reduces flow velocity, rendering many wheels inoperative or abandoned.

2017 – A comprehensive field survey documented 187 extant Rahad waterwheels in Pak Chong, Sikhio, and Sung Noen Districts—the highest known



Figure 2: A set of three waterwheels shares a single weir along the Lamtakong Canal in Sikhio District, Nakhon Ratchasima. Photograph by Narathip Thubthun (2017). CC-BY-SA 3.0 IGO



Figure 3: As the wheel rotates continuously, the attached bamboo cylinders scoop water from the canal and discharge it into the water trough. Photograph by Narathip Thubthun (2014). CC-BY-SA 3.0 IGO



Figure 4: Rahad waterwheels along the Lamtakhong Canal in Sikhio District, Nakhon Ratchasima. Photograph by Narathip Thubthun (2016). CC-BY-SA 3.0 IGO

concentration in South-East Asia.
Contemporary context – Rahad waterwheels are increasingly valued as low-emission, clean-energy alternatives to diesel pumps. Their continuous rotation also facilitates water aeration, contributing to ecological health.

Status of the research and historical documentation
In the context of Thailand's historical record, early references to waterwheels appear in the ancient legal code known as Mangrai Sarttra, attributed to King Mangrai, founder of the Lanna Kingdom. This document, dating back more than 700 years, has been studied by Prasert Na Nagara (1971) and Chappana Pin'ngoen (2008), who identified legal provisions addressing the maintenance of irrigation systems and the equitable distribution of water for rice cultivation. These findings provide strong evidence of the longstanding use of waterwheels in Thai agrarian society.

For the Lamtakong region specifically, Suriya Samuttakub, Pattana Kittiarsa, and Chintana Kleawkla (2004) conducted an anthropological study examining the cultural significance of Rahad waterwheels. More recently, Narathip Thubthun, Thammanoon Yingyuen, Sutanya Sittikulkiat, Sudjit Sananwai, and Jutamanee Jabtakhob (2017) undertook a study focused on the traditional knowledge and cultural heritage of the Rahad Lamtakong. Through participatory research with local communities, the team documented construction techniques, forms, components, and materials, and compiled oral histories from local artisans.

Current status and state of conservation
At present, Rahad waterwheels are still in use for agricultural irrigation, particularly for diverting water into paddy fields. However, a number of structures are now abandoned and in various stages of deterioration. Without ongoing maintenance, unused wheels typically collapse within 2–3 years. The continued existence of these waterwheels depends primarily on practical use by local farmers, and their number is gradually declining due to broader socio-environmental and economic changes.



Figure 5: An integrated network of channels and troughs designed to transport water from Rahad wa-terwheels to agricultural fields located farther away. Photograph by Narathip Thubthun (2014). CC-BY-SA 3.0 IGO

Known threats
Currently, there is no legal mechanism specifically protecting the traditional knowledge associated with Rahad waterwheels. Government agencies often classify the wheels and associated weirs as 'obstructions to waterways', rather than recognising them as cultural infrastructure. Combined with social change in agrarian communities, limited canal access, increased flooding, and a lack of skilled successors, these conditions have contributed to the system's decline.

Protection status
To date, neither national nor local authorities have established any formal statutory mechanisms to safeguard this traditional knowledge in a substantive or enforceable manner.

Registration status in the national or local inventory
In 2024, the Rahad waterwheels of Lamtakong were officially listed in the Preliminary Register of Intangible Cultural Heritage of Nakhon Ratchasima Province, under the authority of the Promotion and Safeguarding of Intangible Cultural Heritage Act B.E. 2559 (2016).

Ownership
The Rahad waterwheels were built by farmers along the Lam Takhong Canal, with ownership varying among individuals, families, informal groups, or cooperatives based on local water-sharing agreements.

Local contacts
Members of Nakhon Ratchasima Provincial Farmers Council and of the Board of Tai-Yuan Cultural Center, Sikhio, Nakhon Ratchasima

The Memorial Bridge



Figure 1: Aerial view of the Memorial Bridge and monument plaza, c. 1932. This photograph captures the complete site in its urban and riverine context, clearly showing the distinct arrow-shaped layout of the approaches on both banks of the Chao Phraya River. Source: 'Bangkok Bridge', *The Engineer*, 154 (1932), 82.

Contributors:
Pinai Sirikiatikul
Assistant Professor,
Silpakorn University

Rungsima Kullapat
Researcher, Carolina Asia Center,
University of North Carolina

State, Province, Region
Thailand

Industrial classification
Transport
Infrastructure
A bascule-type lift bridge across the Chao Phraya River connecting the Phra Nakhon and Thonburi districts of Bangkok.

Further details on the industrial classification
The bridge is a key piece of multi-modal transport infrastructure. Originally, its steel structure was designed to carry a main road, pedestrian footpaths, and two tram lines. Furthermore, its sixty-meter bascule opening was a significant engineering feature designed to accommodate large river vessels, integrating the bridge with the city's vital waterway transport. Its construction was a strategic project to connect Thonburi with the capital, facilitating economic growth and urban expansion.

Brief description

The site comprises the Memorial Bridge (a three-span steel structure with a sixty-metre electrically-powered bascule opening) and the symmetrically-aligned Monument to King Rama I. Originally a multi-modal crossing for road, pedestrian, and tram traffic, its bascule lift mechanism is now disused. The monument showcases significant intangible heritage, featuring a bronze statue by Italian sculptor Corrado Feroci, who was employed by the Siamese government to oversee its casting in Italy. The project involved a transfer of specialised European technology for installing its Venetian Gold Glass Mosaic and is clad in premium granite sourced from both Italy and Germany. Architecturally, the site is a unique hybrid, combining the unprecedented Art Deco style of the British-designed bridge pylons with the pioneering 'modern Thai style' of the monument's concrete base, designed by Prince Narisara Nuwattiwong. Historically, the project is significant as a commemoration of Bangkok's 150th anniversary and one of the last major public works of the absolute monarchy. It was conceived to connect the Thonburi and Phra Nakhon districts, symbolising urban modernisation and national unity.

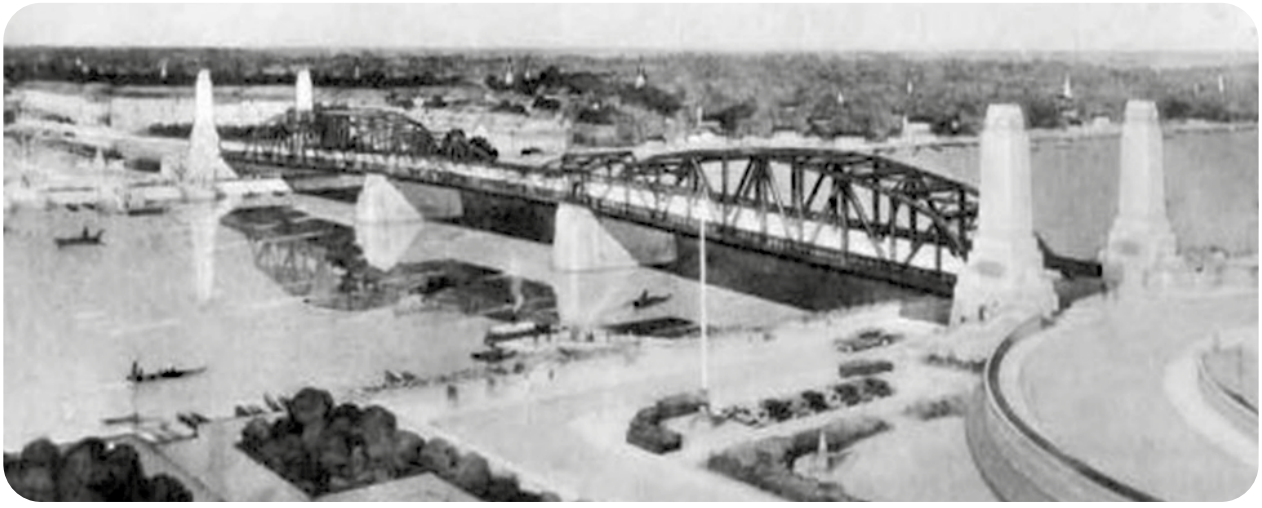


Figure 2: Official perspective painting by the builders, Dorman Long & Co., c. 1930. This image depicts the intended vision for the project, emphasizing the bridge's grand scale and its unprecedented Art Deco pylons. Source: Dorman Long and Company Limited, Bridges: *A few examples of the work of a pioneer firm in the manufac-ture of steel and steelwork* (London: Dorman Long, 1930), 56.

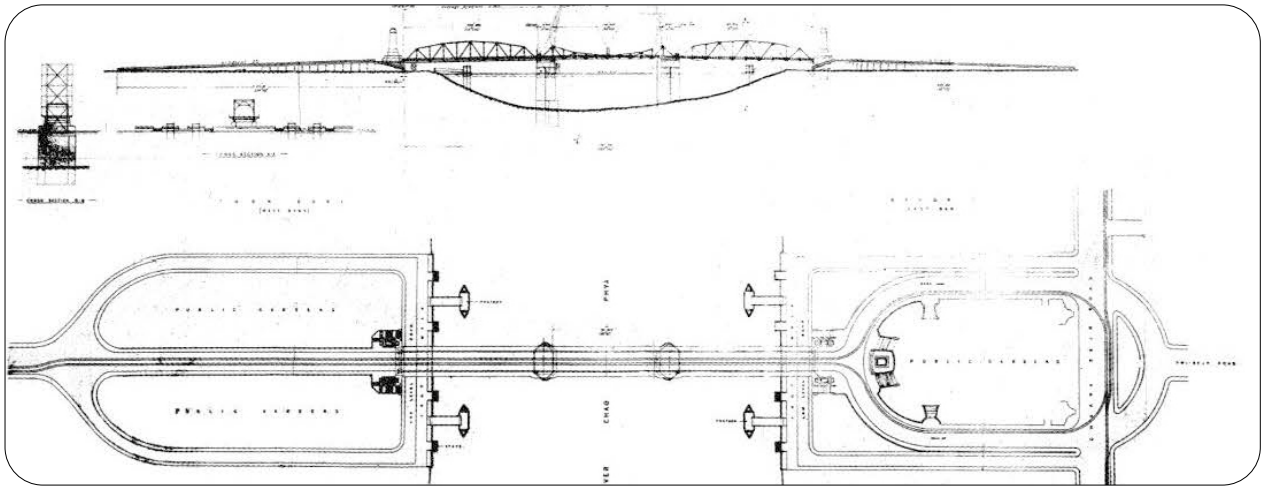


Figure 3: Original architectural drawings, c. 1929, showing the site's top-down plan and side elevation. The draw¬ings detail the engineering of the steel structure, the layout of the monument plaza, and the design of the bascule opening. Source: National Archives of Thailand.

Period(s) of operation
The project was initiated by King Prajadhipok in 1926, with formal planning beginning in early 1928. The construction contract with Dorman Long & Co. of Middlesbrough, England, was signed on July 30, 1929. The completed bridge was formally handed over to the government on June 2, 1931, and the entire site was officially opened to the public on April 6, 1932. While the bridge remains in continuous operation today, its bascule lifting mechanism has been disused since 1984.

Key events/chronology and changes to relevant attributes
The construction was by renowned British engineers Dorman Long & Co., and is significant because they were simultaneously building the Sydney Harbour Bridge in Australia. The same architectural firm, Sir John Burnet and Partners, designed the Art Deco pylons for both, placing the bridge in a global engineering context.

After the 1931 handover, two major defects emerged: a failed underwater electrical cable for powering the bascule, and subsidence in a retaining wall. Both were resolved under the one-year contractor warranty, with repairs funded by a portion of the retention fund.

During World War II, the bridge was damaged in a 1945 Allied air raid and subsequently repaired. Its industrial function changed significantly in 1984 when the bascule lifting mechanism was permanently decommissioned.

Status of the research and historical documentation
The site is documented in both published scholarly works and extensive primary source materials. Previous studies, primarily in English, dealing with the Memorial Bridge as a case study, include Chomchon Fusinpaiboon's PhD thesis analyzing the project's design and economic context and the article Transitional Architecture of King Rama VII Era by Chaipat Ngambutsabongsophin and Sidh Sintusingha.

A collection of primary source documents is preserved and accessible at the National Archives of Thailand (Bangkok). These records include the construction contract with Dorman Long & Co., detailed technical specifications for all decorative elements like Italian stonework and Venetian mosaics, and extensive business correspondence. This correspondence details the complex international logistics, management of supply chain delays, dispute resolutions over defective materials, and the pragmatic cancellation of orders. The archives also hold financial records, official drawings, and documentation of post-handover repairs. Records also survive within Dorman Long & Co's archives, which are held by Teesside Archives (https://www.middlesbrough.gov.uk/leisure-culture-and-parks/teesside-archives/)

Current status and state of conservation
The site is officially listed as 'Well Conserved' and remains a complete, recognised landmark. The bridge is in full daily use for vehicle and pedestrian traffic. Its key operational feature, the 60-metre bascule lifting mechanism, survives but



Figure 4: Historical photograph showing the bridge's primary industrial function (c. 1954). The two bascule arms are raised, allowing a large vessel to pass along the Chao Phraya River. This view demonstrates the original operational capability of the lifting mechanism. Source: *Thailand Illustrated* (April 1954 Issue)

is no longer operational, having been permanently decommissioned in 1984. The structure is sound but shows age-related material deterioration, prompting planned conservation work.

Known threats
The primary threat is the natural material deterioration of the 90-year-old structure due to age and heavy daily traffic, including corrosion of the mild-steel members and damage to the road surface. As a key piece of urban infrastructure, it also faces ongoing pressure from traffic vibrations and adjacent city development. Measures to address these threats include its legal protection as a national ancient monument and the planned conservation work by its government custodians.

Protection status
The site is protected at the national level as a registered ancient monument under The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961. This law provides legal protection for the structure and its immediate setting.

Registration status in the national or local inventory
The site is registered as a national ancient monument by the Fine Arts Department under the 1961 Act. It is featured in the national inventory of protected heritage sites.

Ownership
A project of the Siamese Government, it was partially funded by King Prajadhipok. Historically managed by the Royal State Railways, it is now under the stewardship of the Department of Rural Roads.

Local contacts
The primary official contacts are the Department of Rural Roads, the Ministry of Transport, and the Fine Arts Department within the Ministry of Culture in Bangkok.

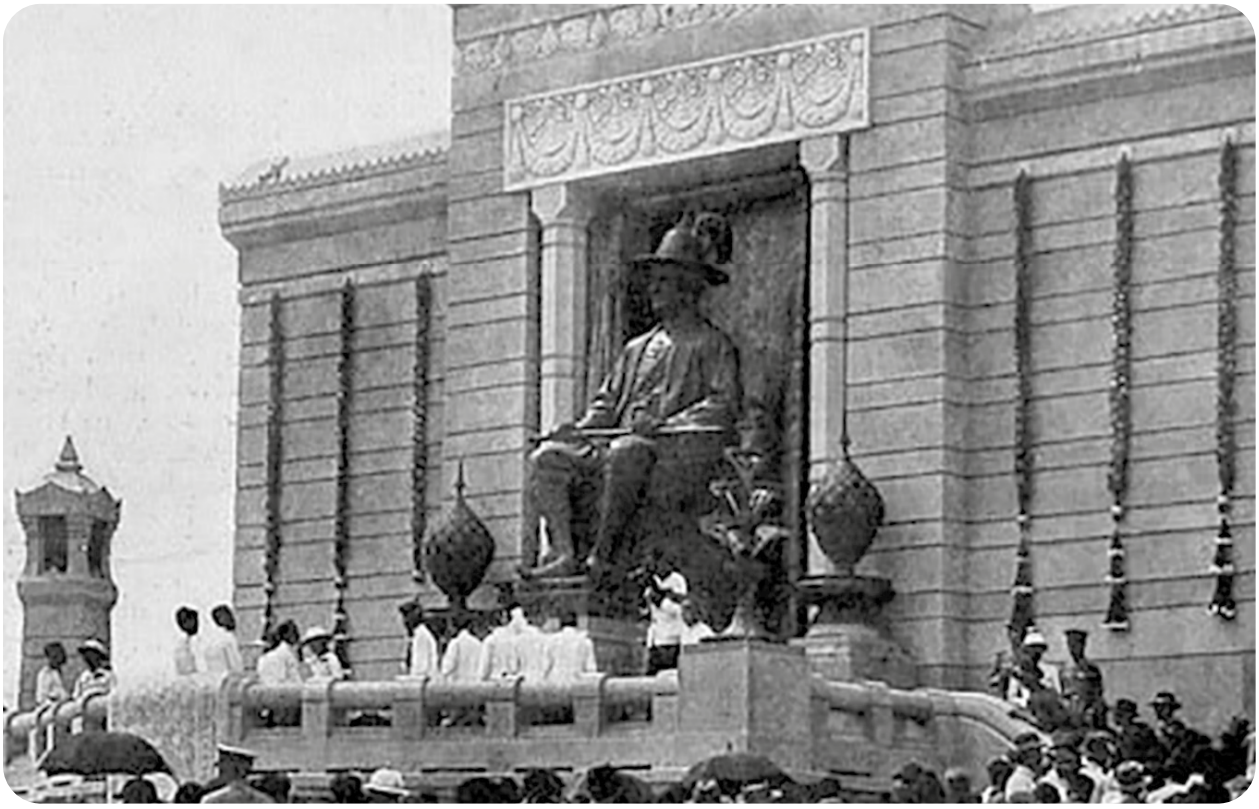


Figure 5: The Monument to King Rama I on the opening day, April 6, 1932. This image captures the site's immediate importance as a major civic space, with the public gathered to celebrate the inauguration of the monument and bridge. Source: 'Le cent cinquantième anniversaire de la dynastie siamoise', *L'ILLUSTRATION 7* (May 1932): 28.

The Thai Paper Mill

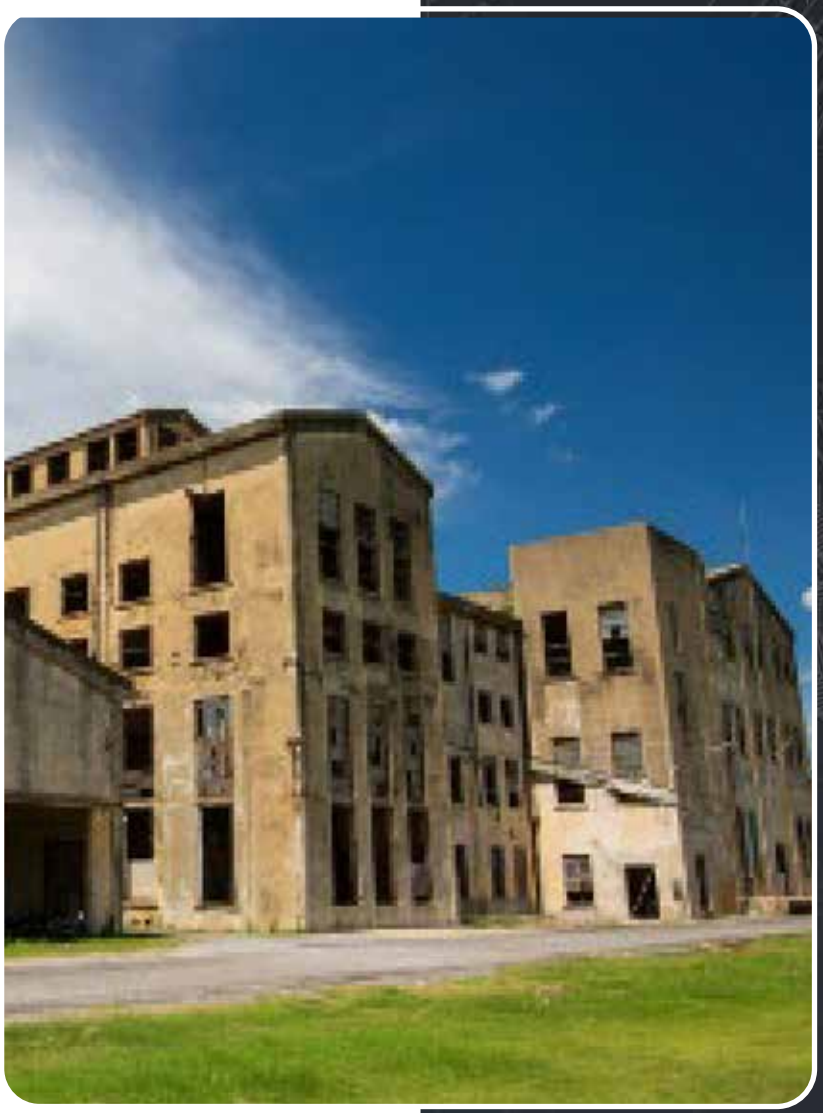


Figure 1: Exterior view of the Thai Paper Mill building. Source: Tourism Thailand. © Tourism Thailand

Contributors:
Supradith Chitagon
Assistant Professor,
Rangsit University

Rungsima Kullapat
TICCIH Thailand,
Researcher at the Carolina Asia Center, University of North Carolina at Chapel Hill, USA

State, Province, Region
Thailand
Kanchanaburi, the western region of Thailand

Industrial classification
Paper, Glass and Packaging

Further details on the industrial classification
The Thai Paper Mill in Kanchanaburi stands as an outstanding example of architectural and industrial heritage of national significance. It is the sole remaining industrial paper production facility from the period when Thailand was transitioning into modernity. During its operational peak, the mill exerted profound technological, economic, and social impacts on Kanchanaburi Province.



Figure 2: The water filtration facility comprises a pump tower, which functions to draw water from the river into a sedimentation basin, a concrete tank where water is left to settle before being pumped into an ele¬vated storage tank. The filtration building serves as the control centre for water treatment and conditioning. Most of the structures remain in relatively good con¬dition, as all components are still in active use today. Photograph by Kantharat Aroonroek (2013). CC-BY-SA 3.0 IGO

Brief description

The Thai Paper Mill in Kanchanaburi represents a manifestation of the Thai state's pursuit of modernity, aimed at attaining a level of progress comparable to that of civilised nations during the era of the People's Party (Khana Ratsadon). This process entailed the importation of political ideas, architectural concepts, and industrial knowledge from the West as part of a broader agenda to transform the nation. The mill was strategically located atop the heart of the old town and its historical monuments. Its main building, designed by German architects, adopted a simplified form of the European medieval style, stripped of ornamental details to align with functional requirements while simultaneously reflecting the political ideology of the People's Party. The construction of such a large-scale industrial facility in an architectural style that was both prominent and entirely distinct from its surrounding context served as a symbolic assertion of the People's Party's administrative authority during the transition to a democratic form of government.

It stands as a testament to the determination to overcome the considerable challenges of construction and the transportation of building materials and machinery to what was, at the time, a remote and undeveloped location. The site embodies evidence of Western influences integrated into local culture through the importation of machinery, technology, architectural forms, and modern production methods from Germany during that era.

Period(s) of operation

The mill was officially inaugurated on 18 September 1938 (B.E. 2481) under the name Thai Paper Mill No. 2. Its primary purpose was to produce paper for domestic use and for the printing of banknotes, with operations managed by personnel from all four branches of the armed forces.

Key events/chronology and changes to relevant attributes
1938 (B.E. 2481) – The facility was completed and officially inaugurated on 18 September 1938 as Thai Paper Mill No. 2.

1945 (B.E. 2488)—The government established an additional paper mill at Bang Pa-In, Phra Nakhon Si Ayutthaya Province. This reduced the strategic role of Thai Paper Mill No. 2, leading to gradual economic decline and reduced activity at the Kanchanaburi site.

1960s–1980s (B.E. 2503–2530) – After decades of operation, the condition of the machinery and buildings deteriorated, reducing production efficiency and requiring substantial maintenance costs.

1973 (B.E. 2516)—Operations at the site ceased, and the facility was abandoned due to the cumulative impact of the aforementioned factors.

Status of the research and historical documentation
Historical documents and academic research concerning the Thai Paper Mill in Kanchanaburi remain limited. Most existing materials comprise online articles produced by both civil society and governmental agencies, focusing primarily on brief historical accounts, the architectural aesthetics of the site, and its potential as a tourism destination.
At the undergraduate level, there have been design projects and theses from faculties of architecture that emphasise adaptive reuse and spatial redevelopment potential. Notably, the project Mixed-Use Development for Learning at the Thai Paper Mill, by Kantharat Arunrerk (2013), proposed strategies for reconfiguring the site's layout and landscape by integrating contemporary learning activities with public functions.

Current status and state of conservation
Current conservation efforts are primarily driven by public awareness and advocacy, resulting in the establishment of discussion platforms involving Phumueang Kan, a local civil society group; Kanchanaburi Rajabhat University, the academic sector; and the Kanchanaburi Provincial Administrative Organisation as the representative of the state sector.

Known threats
The growing awareness and activism of local civil society, recognising its value and significance. State ownership of the land and the factory has helped keep the risk of adverse change from current development policies at a relatively low level.

Protection status
No statutory protection, but support from Phumueang Kan, a local civil society group, Kanchanaburi Rajabhat University representing the academic sector, and the Kanchanaburi Provincial Administrative Organisation as the representative of the state sector.

Registration status in the national or local inventory
None

Ownership
The State Treasury Department, which has delegated the responsibility for its oversight and management to the Kanchanaburi Provincial Administrative Organisation.

Thonburi Naval Dockyard



Figure 1: A contemporary view of the historic Dry Dock No. 1 at the Thonburi Naval Dockyard, with workshops and the lighthouse visible in the background

Contributors:
Pinai Sirikiatikul
Assistant Professor,
Silpakorn University

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

State, Province, Region
Thailand
2 Arun Amarin Road, Siriraj, Bangkok Noi District.

Industrial classification
Engineering
Transport
Military

Further details on the industrial classification
This site is classified under Engineering and Transport due to its continuous operation as the Royal Thai Navy's primary shipbuilding and repair centre since 1890. It undertakes the construction, modification, and repair of diverse vessels—from warships to Royal Barges—and related mechanical equipment. The dockyard is a prime example of large-scale industrial development in Thailand, incorporating advanced engineering technology.

Brief description

The Thonburi Naval Dockyard is a historic industrial landscape covering approximately 144,970 sq. m. along the Chao Phraya River. This large complex, bounded by canals and roads, includes two historic dry docks (1890, 1936), numerous workshops (Mould Loft for shipbuilding, Foundry, Carpentry, and Steel Fabrication) with distinct wooden and steel truss structures, and historic gingerbread-style administration buildings. It also contains walls from a former 18th-century royal palace and the preserved Ubosot of Wat Wongsathirat. The site's function has evolved from a royal shipyard to a modern naval facility. Its historical significance is multilayered. The land was the original residence of the military leader who later was crowned as King Rama I, founder of the Chakri Dynasty. As a dockyard, it was officially opened by King Chulalongkorn (Rama V) and was the site of King Bhumibol Adulyadej's (Rama IX) key indigenous patrol boat project. The intangible heritage is profound, encompassing generations of naval engineering skills that blend traditional craftsmanship with modern industrial technology, which led to the founding of the Naval Dockyard School in 1945. It also upholds the cultural traditions and royal ceremonies associated with launching new vessels.



Figure 2: Aerial view of the Thonburi Naval Dockyard and the surrounding Thonburi landscape, taken on May 7, 1946. Source: National Archives of Thailand

Period(s) of operation

The land has been historically significant since the 18th century. Its transition to a naval facility began in 1883. However, the formal period of operation as an industrial site commenced on January 9, 1890, with the official opening of the Royal Dockyard by King Chulalongkorn (Rama V). The site has been in continuous operation since, undergoing major development including the construction of its two primary dry docks (1890, 1936) and remaining active to this day.

Key events/chronology and changes to relevant attributes

The site's industrial history began after King Chulalongkorn (Rama V) granted the land, a former royal residence, to the navy. On January 9, 1890, the King presided over the opening ceremony of the Royal Dockyard, inaugurating the first wooden dry dock by bringing the warship HSMS Harn Hak Satru into it.

Major physical upgrades followed. The dock was rebuilt and expanded in concrete in 1906, creating 'Dock No. 1'. To support a growing fleet after the Siamese revolution, a second, larger concrete dock was built in 1936 by Christiani & Nielsen.

Pivotal events for its intangible heritage include the founding of the Naval Dockyard School in 1945. Later, King Bhumibol Adulyadej (Rama IX) initiated an indigenous patrol boat project, personally laying the keel for the T.91 vessel in 1967 and, with Queen Sirikit, launching it in 1968. In 2011, the site's function expanded to include public heritage with the opening of the Royal Dockyard Museum in a restored historic workshop.



Figure 3: Aerial view of the Thonburi Naval Dockyard and the surrounding Thonburi landscape, taken on May 7, 1946. Source: National Archives of Thailand

Status of the research and historical documentation

The site is well-documented, with the most comprehensive recent study being the Historical Value Assessment of the Naval Dockyard, 2017. This report assesses 60 historic buildings and structures on the site, categorizing them into three primary levels of recommended conservation, from national registration to rehabilitation. The study, primarily in Thai, synthesized major sources including Royal Gazettes, historical chronicles, and archival maps to fill a significant knowledge gap.

It confirms the existence of extensive records such as business logs, architectural drawings, and historical photographs. A key repository for these materials is the on-site Royal Dockyard Museum, which was established to preserve and display equipment, tools, machinery, and valuable documents related to the dockyard's history, making them accessible to the public. Further official records are held by the Royal Thai Navy and the National Archives of Thailand. While the 2017 study is extensive, opportunities for more specialised research remain.

Current status and state of conservation

The site is an active, working naval dockyard. The industrial complex is largely complete and fully operational, not ruinous. Much original and historic equipment and machinery survives; some pieces are preserved for display in the on-site Royal Dockyard Museum, while others remain integral to the workshops. While its primary function of shipbuilding continues, its role has expanded to include public heritage and education.



Figure 4: A historical photograph of the opening ceremony for the Royal Dockyard on January 9, 1890, showing the first dry dock, presided over by King Chula¬longkorn (Rama V). Source: Royal Dockyard Museum 84th Anniversary



Figure 5: Interior view of the historic boiler room (Building 130) within the Thonburi Naval Dockyard, showcasing the large boiler and associated pipework. Photograph by Pinai Sirikiatikul (2017). CC-BY-SA 3.0 IGO

Known threats
The main threat is the potential impact of regional urban planning, notably the repeatedly proposed Chao Phraya Riverside Road Project. Though strongly opposed and currently shelved, its history of resurfacing—especially under military governments—keeps the risk alive. A 2017 assessment of the site's historical and architectural value supports conservation-led development. A proposed large-scale naval museum would help ensure heritage preservation remains central to any future plans.

Protection status
Under the 1961 Ancient Monuments Act, the two dry docks, the Ubosot (temple), and the historic palace walls are officially registered as national monuments.

Registration status in the national or local inventory
Yes. While the site is not registered in its entirety, four specific monuments within its boundaries feature in the national heritage database of Thailand. An official announcement by the Fine Arts Department confirms the registration of Dry Dock No. 1, Dry Dock No. 2, the Ubosot of Wat Wongsathirat, and the Old Palace Walls as national monuments.

Ownership
The property is under the complete ownership and jurisdiction of the Royal Thai Navy. The land was officially granted to the Naval Department by King Chulalongkorn (Rama V) in 1883 and has remained under naval control since.

Local contacts
For further information, the appropriate official channel would be the Naval Dockyard Department, Royal Thai Navy, as they are the owners and operators of the site.

Tin Industry Heritage along the Andaman Coast

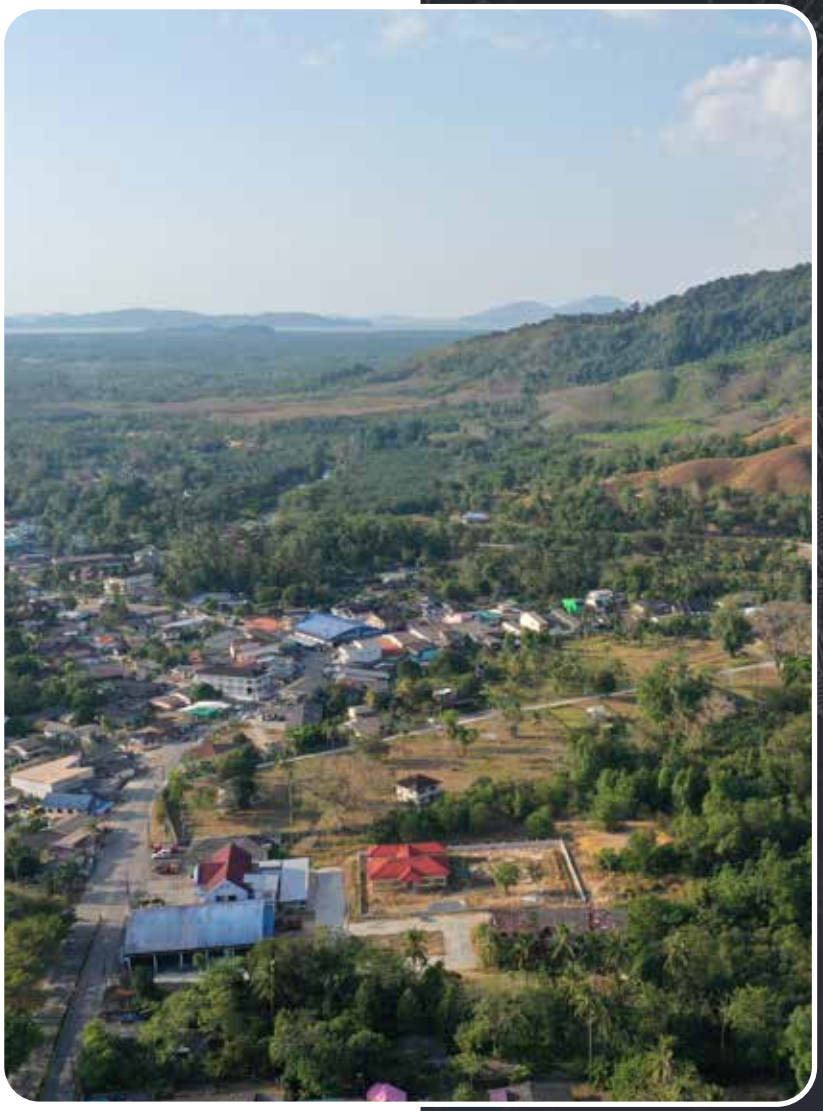


Figure 1: Settlement of miners' Siamese Tin Syndicate in Ranong, Thailand

Contributor:
Rungsima Kullapat
TICCIH Thailand

State, Province, Region
Thailand
Ranong, Phang-Nga, Phuket

Industrial classification
Mineral Products - Tin

Brief description

Tin is a vital natural resource and fundamental metal that attracts international investment and power. There are 12 major belts of tin in the world. Most of the world's tin production since 1800 has come from the South-East Asian Belt, which stretches for 2,800 kms from China, and across Myanmar, Thailand, and Malaysia to Indonesia. This belt holds an estimated 54% of the world's tin. The enormous availability of this resource has been attractive for mining and investment, notably by the Chinese and towards South-East Asia.

The current geographic division of Southern Thailand consists of 18 provinces. However, in the past, cities were known by different names. This paper focuses specifically on the so-called 'Tin Cities', which are the cities with the highest concentrations of tin in Thailand, located in three of the six tin-producing provinces along the Andaman coast (as identified by the Department of Mining). These Tin Cities include Phuket (formerly Junk Ceylon), Phang Nga (Takuapa), and Ranong.

The settlements historically had large Chinese populations, comprising both tin mine workers and mine owners. As part of the overseas Chinese community that migrated from China to work into South-East Asia, they were often compelled to join secret societies and had to affiliate with a specific association for protection. The Chinese immigrants who played a role in tin mining in Thailand can be categorized into two groups. The first group consisted of those from impoverished backgrounds who worked as labourers in the mines. The second group comprised wealthier individuals who entered into joint ventures with local governors, serving as investors in the mining industry.



Figure 2: Iron bridge for transporting ore at Chitti Boonsoong Tin Dredging Company, Takuapa, Phang Nga.

Accordingly, distinct features of cultural heritage in Southern Thailand, especially those associated with overseas miners, can be categorized as follows:

The tangible heritage as material assets (immovable and movable):

Immovable assets: Residential Sino-Colonial style buildings like shophouses, bungalows, and mansions of notable individuals, as well as industrial structures such as factories, tin mines (including pit mines), train tracks for moving tin ore, and Chinese shrines.

Movable assets: Artifacts such as surviving mining equipment, electricity generators, a dredging plant, and boring equipment.

The intangible heritage dimensions:

This includes aspects of miners' cultural legacy that formed the communities' way of life, such as foodways (including traditional food preparation of both savory and sweet dishes), the preparation of soy sauce, attire, religious practice and rituals, belief systems, and local ceremonies such as the Vegetarian Festival and the 'Por Tor' Festival. These elements represent unique cultural heritage that distinguishes the area from other regions in Thailand.



Figure 3: 100-Year-Old Chinese Charcoal Kiln at Rachakrud, Ranong



Figure 4: Tin Dredge at Bangtao Beach, Phuket in 1950

Period(s) of operation

The operations of the tin industry in Southern Thailand can be divided into two periods:

Pre-Industrial Revolution: Operated by local communities and Chinese settlers, from prehistoric times up to the 20th century.

Industrial Revolution: Operated by the British and other Commonwealth countries, from the early 20th century until the 1990s.

Key events/chronology and changes to relevant attributes

South-East Asia's tin industry was a powerhouse of historical influence and immense wealth, built largely on the backs of migrant labourers known as 'coolies'. While the term carries a heavy history, many of these individuals sought a fresh start, finding a quality of life in the mines that, despite the hardships, offered more promise than the conditions they left behind. Today, these miners are the foundational ancestors of the majority of residents in Southern Thailand. Far from being a forgotten chapter of history, their legacy is a profound source of local pride. Many descendants have transformed their homes into personal archives, carefully collecting and preserving the artifacts of their mining heritage to keep their ancestors' stories alive.

However, the tin mining industry in the Southern Thailand originated in pre-historic times, with ore extraction relying upon local labour and traditional methods, such as washing, ground sluicing, and open-pit mining.

This changed with the Bowring Treaty of 1855 which ended the Siamese State's monopolies over resources. It established a protected British trading monopoly with Siam, which forced the monarchy to sell exclusively to the British. Tin was included in this treaty. The turning point for the Siamese tin mining industry was the rising price of tin on world markets from the late 1890s, but Siam was far behind the neighbouring South-East Asian countries.

In 1900, Siam produced only 3,900 tons as compared to 42,444 tons from the Federated Malay States. In September 1906, Captain Edward Thomas Miles signed a concession agreement giving him dredging rights to Phuket harbor. Miles invented bucket dredging for tin by adapting dredges from the Suez Canal. This bar graph shows the success of dredges for tin mining. (Figure 1?)

In the 1990s, the tin mining industry ceased operations, but although tin mines no longer operate in Southern Thailand, traces of the history of tin mining and its culture are still present.

Status of the research and historical documentation
In 2022, a study entitled 'The Development of tin mining industrial heritage for creative cultural tourism in southern Thailand's Andaman provincial cluster from cultural capital (BCG, 2022, unpublished) was conducted. The research examined the settlement patterns of mining communities across interconnected tin-mining towns in Ranong, Phang Nga, and Phuket and highlighted their linkages to Malaysia. However, studies on the Andaman tin route have generally taken the form of theses or academic articles. Examples include Economic Changes from Tin Mining to Tourist Industry in Phuket 1941–1987 (Na Ranong, 2007), Hokkien Chinese on the Phuket Mining Frontier: The Penang Connection and the Emergence of the Phuket Baba Community (Nasution, JMBRAS, Vol. 81, Part 2, 2009, pp. 81–112). Another example is The Development of Chinese Capital in Southern Siam, 1868–1932 (Songprasert, 1986), which discusses the flow of capital in Southern Thailand originating from tin-mining investors and presents the settlement patterns and management approaches of miners in Ranong, Phang Nga, and Phuket.

Current status and state of conservation
In the past, the significance of mining heritage was not widely recognised. Some equipment was preserved in local museums, while the only surviving dredge sank into the sea; the rest was sold off as scrap by both the government and the private sector. What remains are small-scale mining tools, such as buckets and tin-panning trays. Many former mine pits have been converted into lagoons or aquaculture ponds, and former mining engineers' residences have been repurposed as hotels.

Known threats
Neglect by the government, coupled with the destruction of much mining evidence due to legal requirements to demolish structures deemed harmful to the environment, has resulted in the absence of systematic conservation or documentation of artefacts. Management has typically involved placing objects in local museums without comprehensive preservation efforts.

Protection status
In the absence of any agency responsible for protection and preservation, the safeguarding of these heritage assets has been left solely to individuals and the private sector.

Registration status in the national or local inventory
All the mines under the Department of Mineral Resources, Subdistrict Administrative Organisation (SAO) and the owners.

Ownership
Tin mining concessionaire, Subdistrict Administrative Organisation (SAO) and municipalities.

Local contacts
1. Ranong, Phang-Nga and Phuket Chamber of Commerce
2. Ngow Heritage Trust, Ranong
3. Chitti Boonsong Company, Takuapa, Phang-Nga
4. Anupas and Son Company, Phuket

Phrae Basin's Teak Forestry Heritage

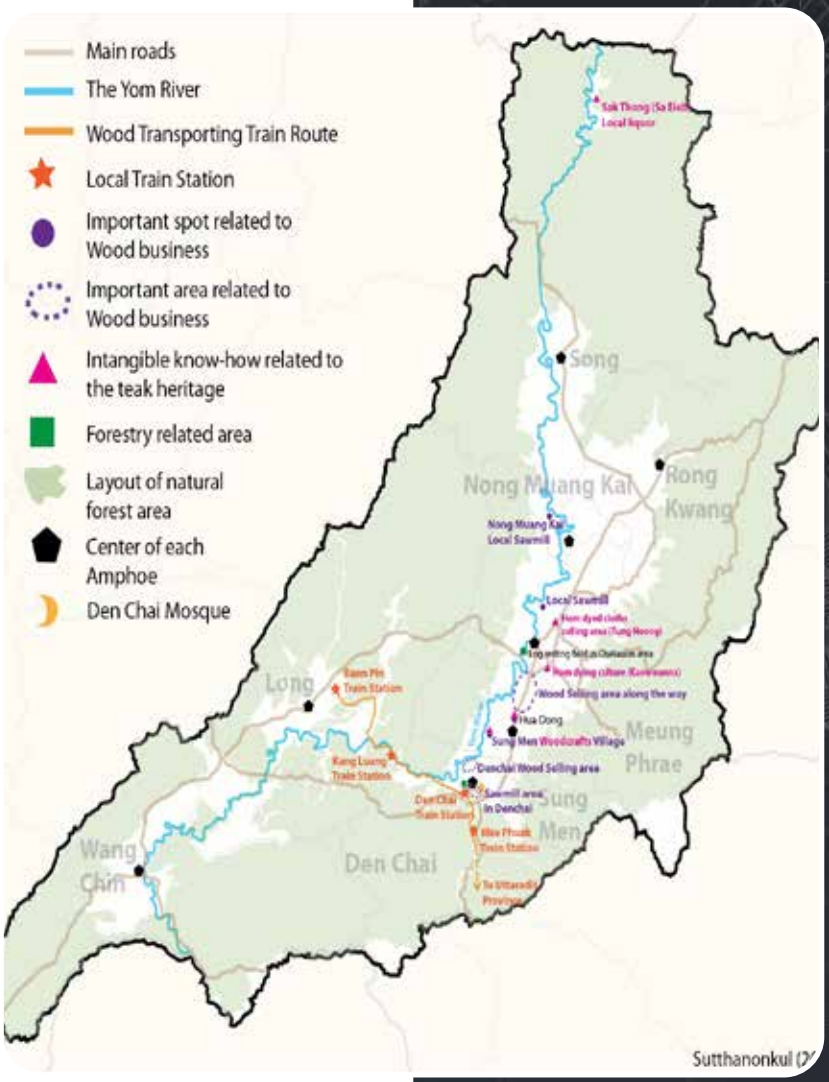


Figure 1: The map presents an overview of the Phrae Teak Forestry Heritage, encompassing the province of Phrae, from its abundant forest (highlighted in green) landscapes to Muang Phrae (red shaped graphic) to related components supporting this industry, and the historic urban centre located within the basin along the river, which historically served as the main route for transporting teak logs within the region and beyond. Author: Supitcha Sutthanonkul (2022). © Supitcha Sutthanonkul

Contributor:
Supitcha Sutthanonkul
SEAMEO SPAFA
Researcher/ ICOMOS
International Member

State, Province, Region
Phrae Province, Thailand

International designations
Currently, there is no international designation that encompasses and protects all attributes conveying the full range of values of this heritage place.

Industrial classification
Forest Industries

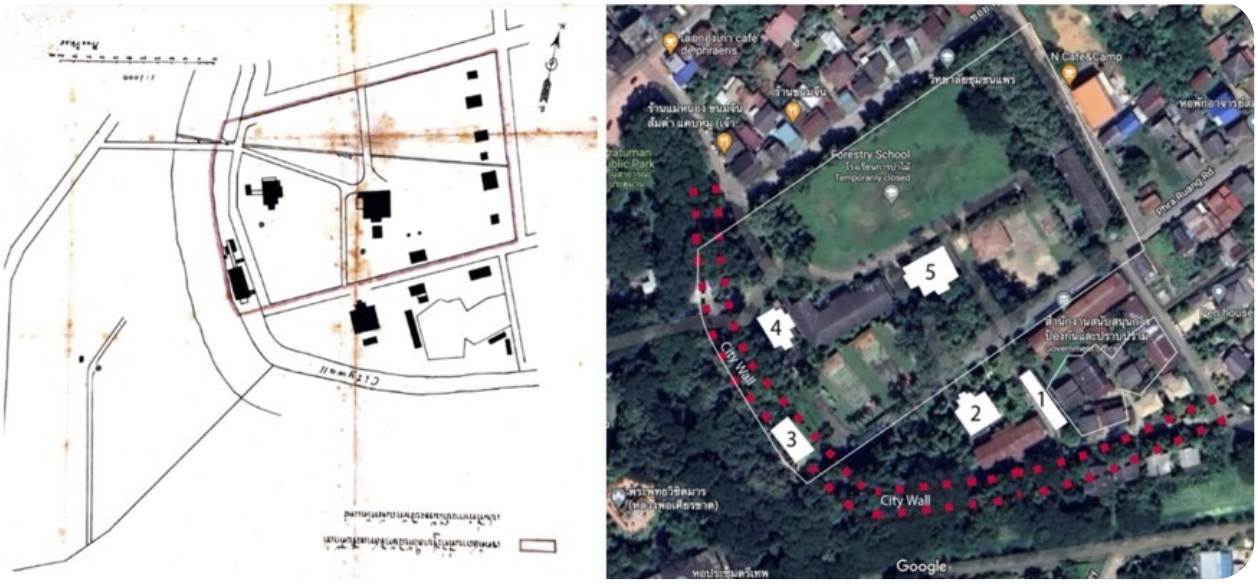


Figure 2: An example of built heritage from the teak forestry industry in Phrae is illustrated through comparative old maps, showing the area formerly leased by the East Asiatic Company as a foresters' compound alongside a current map indicating existing buildings. These include structures now under the care of the natural heritage authority, some of which have been adapted for new uses, such as the Teak Museum (Building 2) and administrative functions (Building 1), while others remain abandoned (Buildings 3, 4, and 5). Author: Supitcha Sutthanonkul (2022). © Supitcha Sutthanonkul

Further details on the industrial classification

The Phrae Basin's Teak Forestry Heritage embodies both tangible and intangible legacies of a historically very significant forest industry. Although the teak industry is widely recognised for its prominence during the foreign concession period, archival records and written documentation from the National Archives reveal that teak exploitation in Phrae and its surrounding areas had been established well before the 20th century, originating during the era of local rulers.

This class of industrial heritage encompasses structural and spatial elements such as logging camps, sawmills, timber storage yards, river transport facilities, and related urban infrastructure that supported the teak trade. As an industrial landscape, it integrates forested areas, waterways, transport routes, and settlements shaped by the timber industry's demands, illustrating the transformation of the natural environment for production purposes. The heritage also includes movable artifacts and documentation, such as logging tools, mechanical equipment, company records, and photographs, all of which help to capture the operational and social history of the trade. Equally vital is its intangible heritage, reflected in the specialized knowledge of teak harvesting, forest management, and river log transport, as well as the multicultural workforce traditions that evolved around the industry. Together, these elements position the Phrae Basin's teak forestry heritage as a holistic industrial landscape of outstanding historical, technological, ecological, and socio-economic value, fully consistent with the principles set forth in the ICOMOS–TICCIH Dublin Principles and the Nizhny Tagil Charter.

Brief description

The Phrae Basin's Teak Forestry Heritage represents a unique cultural–natural landscape shaped by centuries of interaction between people, forests, and the teak industry. Once a major centre of Thailand's teak trade, the basin's rich forests are a major source of the specific species, Tectona Grandis, one of the most famous tropical hardwood trees. Together with the waterways and settlements, they reflect both the natural abundance

of the region and the cultural practices developed around sustainable timber extraction, transportation, and processing. This heritage embodies the integration of local traditions, forest management, and early scientific forestry, while influencing the province's urban fabric, architecture, and economy. Today, it stands as a living legacy linking cultural identity, ecological stewardship, and community livelihoods.

Period(s) of operation

The Teak industry in Phrae Province pre-dates the 20th century, the early concessions originating among cities in the north which were governed by local rulers who reigned over different basins and their communities. The teak industry in Phrae therefore operated over three broad historical periods:

1) Pre-Concession Period (before late 19th century): Originating under local rulers, teak harvesting was managed through traditional practices for local use and small-scale trade, with evidence from archival records showing activity well before the 20th century.

2) Concession Period (late 19th century to mid-20th century): Marked by the arrival of foreign timber companies, notably British firms, operating under agreements with local and later central authorities. This era saw large-scale logging, the introduction of industrial methods, and the transformation of Phrae's urban and cultural landscape.

3) Post-Concession and Conservation Period (mid-20th century to present): Characterised by nationalisation, tighter forest regulations, the 1989 nationwide logging ban, and a shift toward conservation, reforestation, and heritage recognition, with the teak legacy now forming part of Phrae's cultural-natural identity and sustainable tourism initiatives.

Key events/chronology and changes to relevant attributes

1. Pre–20th Century Origins (Local Rulers' Period)

Early Utilization of Teak Forests: Local rulers (Chao Luang Phrae) oversee forested territories, with teak used for local construction, temples, royal buildings, and barter trade.

• Traditional Forest Management: Harvesting follows customary rules tied to seasonal cycles and river transport patterns.

• Early Trade Networks: Evidence from national archives and written documentation shows teak logs floated along the Yom River to regional markets before foreign concessions began.

2. Late 19th Century – Rise of Foreign Concessions Siam – Foreign Trade

• Expansion: Under late 19th to early 20th century, treaties open northern forests to foreign timber companies, especially British companies such as the Bombay Burmah Trading Corporation.



Figure 3: (Left) Building 5, (middle) Building 3, and (right) Building 1 (as indicated in the plan in fig.02), all located within the former foresters' compound of the East Asiatic Company; some of these buildings are currently unused. Author: Supitcha Sutthanonkul (2022). © Supitcha Sutthanonkul



Figure 4: Photographs presenting a selection from Phrae's urban built heritage, highlighting examples of teak buildings in Muang Phrae. Some remain in public use, others are now residential, and several are already listed in the National Inventory. Author: Supitcha Sutthanonkul (2022). © Supitcha Sutthanonkul

• Establishment of Concession Areas: Large-scale logging begins under agreements with local rulers and later with the central government.

• Introduction of Industrial Methods: Use of elephant logging, log rafts, and systematic felling, marking a shift from purely local to commercial extraction.

3. Early 20th Century – Industrial and Urban Impact

• Growth of Phrae as a Forestry Hub: Sawmills, storage yards, and administrative offices established in town.

• Infrastructure Expansion: River transport, logging camps, and worker housing reshape the cultural landscape; teak industry drives urban growth.

• Social Change: Multicultural labour force (local, Burmese, Shan, and foreign supervisors) influences Phrae's social fabric.

4. Mid 20th Century – Transition and Decline of Large-Scale Logging

• Nationalization and Regulation: Government policies tighten control over forests, shifting concessions to Thai operators.

• Resource Depletion Concerns: Overharvesting leads to reduced yields; awareness of forest conservation begins to emerge.

• End of Major Concessions: Gradual phasing out of large-scale foreign-led operations.

5. Late 20th Century – Shift Toward Conservation

• Logging Ban (1989): Nationwide ban on commercial logging enacted after severe flooding and deforestation crises; Phrae's teak forests placed under strict conservation.

• Reforestation and Community Forestry: Programmes launched to restore degraded forests and promote sustainable use.

6. Present Day – Heritage Recognition and Sustainable Stewardship

• CulturalNatural Heritage Integration: Recognition of teak industry's legacy as part of Phrae's identity and cultural landscape.

• Heritage Tourism Development: Historic sawmills, old concession offices, and riverside logging routes preserved or interpreted for visitors.

• Community Engagement: Local communities involved in storytelling, craft production, and sustainable forest-based livelihoods.

Status of the research and historical documentation

The Phrae Teak Forestry heritage is well documented, especially in the concession-era (late 19th–early 20th century). It is therefore strongly documented in government and corporate records and visual collections, and features in company histories and accounts of firms such as the East Asiatic Company and Bombay Burmah. In addition, many historic buildings and compound records in Phrae attest to that period. Also, there are official forestry records and technical reports held by the Royal Forest Department (RFD) and related agencies which provide the legal/administrative backbone for 20th-century forestry policy, concession registers, and later conservation measures. These sources underpin analyses of how management changed after the establishment of the RFD in the 1890s.

Current status and state of conservation

The Phrae forest industry's tangible heritage is partially conserved, with notable examples restored and in use, but much of the industrial fabric and intangible knowledge has already been lost or is at risk. A coordinated approach involving documentation, adaptive reuse, and integration into cultural tourism and education would strengthen long-term conservation. Site conservation details include:

1. Physical heritage

• Surviving concession-era buildings: several teak company offices, manager residences and warehouses survive in Phrae town, some restored for museums, tourism, or adaptive reuse.

• Industrial remnants: a few sawmill structures, logging equipment, and river-transport facilities survive, although many have been lost to decay, redevelopment, or neglect.

• Urban fabric and landscape context: former concession compounds are still legible in town layouts, but surrounding riverfront and forest areas have undergone major changes, diminishing original industrial settings.

2. Current uses & adaptive management

• Restored sites such as the former East Asiatic Company headquarters serve as museums or cultural centres, raising awareness of teak heritage.

• Other historic buildings are in private hands, some maintained, others altered or under threat from redevelopment.

• The link between these heritage assets and broader forest conservation narratives is emerging but not yet systematically integrated.

3. Documentation & archives

• Archival records (Royal Forest Department, National Archives, corporate archives in Thailand and abroad) preserve legal, administrative, and operational histories.

• Photographs, maps, and personal collections are available but scattered; digitisation and public accessibility remain incomplete.

• Some oral history work has been initiated, but much intangible knowledge is at risk of disappearing.

Known threats
Threats and challenges for Phrae Teak Industrial Heritage include the physical deterioration due to age, weather, and lack of maintenance for unused buildings. There is also significant redevelopment pressure in urban areas, leading to demolition or alteration of heritage structures. Additional threats include continuing loss of intangible heritage, including traditional logging knowledge and community memory as well as fragmented management responsibilities and the absence of a comprehensive conservation plan.

Protection status
The natural attributes associated with the Phrae teak industrial heritage, including remaining teak forests and related ecosystems, are protected under several legal frameworks. This includes the National Reserved Forests Act (1941, revised 1964), which designates and regulates the use of reserved forest lands; the Forest Park Act (1992), which provides for the establishment and protection of forest parks for conservation and recreation; and the Community Forest Act (2019), which recognises and supports local community rights to manage and conserve forests sustainably. However, the main buildings within the former teak industrial compounds, including the forester houses, are currently under the care of the national natural heritage authority, as they are situated on land under its jurisdiction. These structures have not yet been listed as Ancient Monuments in the national cultural heritage inventory and therefore lack formal protection under cultural property legislation. However, some of these buildings are located along the historic city wall of Phrae, which is itself a registered Ancient Monument under national protection. In such cases, the Fine Arts Department and the Royal Forest Department are currently in ongoing collaboration to safeguard these significant structures and clarify their extent to ensure appropriate conservation measures. Nevertheless, some important houses, some religious sites and temples established as a direct result of the industry's presence and patronage, have been officially recognised and listed, thereby benefiting from legal protection and conservation oversight.

Ownership
- Royal Forest Department (RFD)
- Fine Arts Department (FAD)
- Privately own property related to the teak industry
- Phrae local initiatives and local peoples' networks
- Other relevant government agencies oversee treasury assets.

Local contacts
The Active Generation of Phrae Family
https://www.facebook.com/phrae.fam/?locale=th_TH

Viet Nam

Contributors:

Trung Ngoc Lan
Docomomo Viet Nam
Hanoi University of Civil Engineering

Historic Overview

The history of Viet Nam is a long and complex narrative marked by thousands of years of Chinese domination, a century of French colonisation, decades of war (the First Indochina War and the Viet Nam War), and a post-war transition to a unified, socialist-oriented market economy. The scale of the constant existential threat faced by Viet Nam is well illustrated in the Military History Museum in Hanoi, where it is observed that Viet Nam has been forced to wage wars of resistance against invaders on 13 separate occasions since 214 BC (see Figure 1). Prior to the 10th century, Vietnam's first civilizations are thought to have emerged in the North of the country in the Red River Valley around 5,000 years ago. Vietnamese myths refer to the Hùng kings and the Hồng Bàng dynasty, a period that is believed to have established early statehood.

The first period of colonisation commenced during the Han dynasty which heralded the beginning of a period of over a thousand years of Chinese rule and influence, but was frequently interrupted by Vietnamese

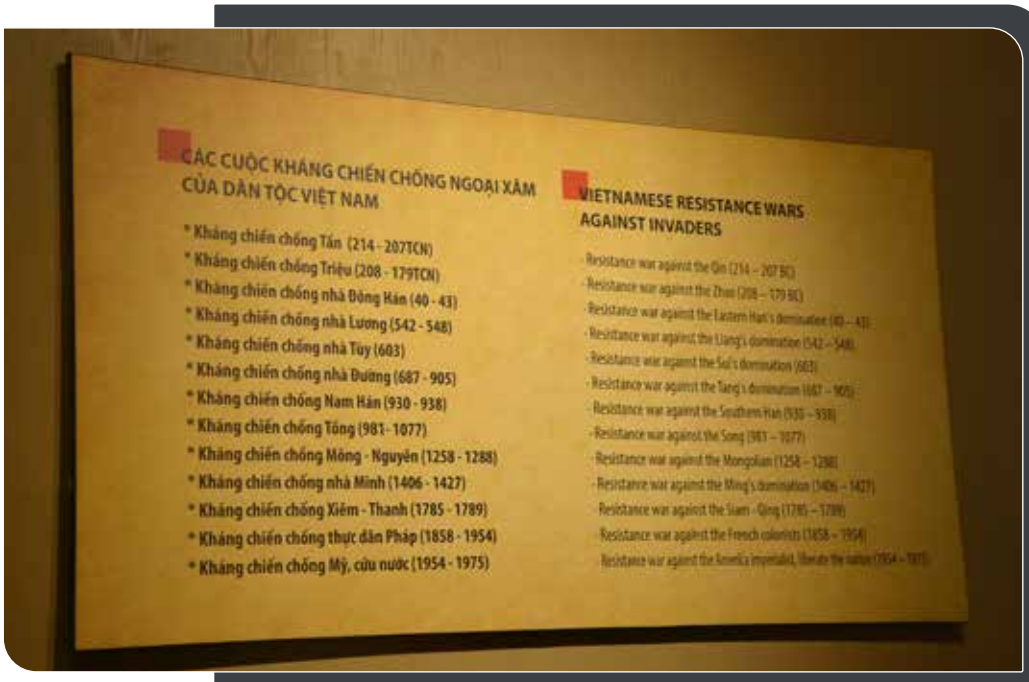


Figure 1: Viet Nam Military History Museum, Hanoi: Viet Nam has constantly had to defend itself against foreign invasion throughout its history. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO

rebellion. Independence from China was regained in 939 AD, after which there followed a sequence of local dynasties that resulted in the country roughly taking on its current form, expanding its territory, particularly in the South around the Mekong delta.

In the mid-19th century, European colonising invaders arrived from France. Using the persecution of Christian missionaries as a pretext, they commenced the colonisation of Viet Nam, establishing a French protectorate and dividing it into three administrative regions – Cochinchina in the South, and Tonkin in the North, with Annam in between. These, along with Cambodia, were combined to become French Indochina in 1887, with the subsequent addition of Laos. The often brutal, exploitative nature of French colonial rule provoked powerful nationalist independence movements.

In the 20th century, these climaxed with the First Indochina War, which followed the occupation of Japan during World War II. After the defeat of Japan in 1945, Viet Nam's Communist leader, Ho Chi Minh, declared independence. However, France was not prepared to cede its colony and instead sought to reassert its rule. The western Allies yielded to their pressure and allowed the French to do so, triggering the First Indochina War. This concluded with the decisive defeat of French forces at the Battle of Điện Biên Phủ in 1954.

At the time, Western powers' fears of communism were fuelled by the Cold War and resulted in the 1954 Geneva Accords, which temporarily divided the country into communist North Viet Nam and an anti-communist South Viet Nam. The hope was that nationwide elections planned for 1956 would unify the country. These were never held because of American and South Vietnamese government fears of a communist victory.

This resulted in the Viet Nam War, also known as the 'The Anti-American Resistance War', in which the North Vietnamese Army and Viet Cong guerrillas in the South fought the South Vietnamese government, who were assisted by the United States. American military involvement grew rapidly following the assassination of President John F. Kennedy in 1963, and peaked in 1968. American troops withdrew after the Paris Peace Accord in 1973, and North Viet Nam then launched a final offensive, unifying the country under communist rule in 1975.

The Socialist Republic of Vietnam was formally established in 1976, but in the late 1970s, Vietnam was involved in further conflicts, first with neighbouring Cambodia when it was instrumental in overthrowing the genocidal Khmer Rouge regime. There was also a brief border war with the People's Republic of China. This was also a period of substantial emigration during which Vietnamese citizens, especially from the South, sought refuge outside the country.

During the first years of unification, the new communist government attempted to establish a centrally planned economy and was hampered by Western trade embargoes. However, in 1986, Viet Nam introduced the Đổi Mới economic reforms, which launched market-oriented policies that ultimately resulted in economic growth and helped integrate the country into the global economy. The lifting of American trade sanctions followed in 1994, and diplomatic relations were re-established with the USA a year later. Viet Nam has since emerged as a one-party socialist state with one of the world's most dynamic market economies.

National Industrial Narrative

Viet Nam's industrial history has evolved from a primarily agrarian, colonial economy to a centrally planned socialist system that struggled with inefficiency, and finally, after the 1986 Đổi Mới reforms, evolved into a rapidly growing market-oriented manufacturing powerhouse.

Before the arrival of European colonial powers in 1858, Viet Nam was overwhelmingly agrarian, centred on wet-rice cultivation in the Red River Delta. While agriculture was the focus, a sophisticated handicraft sector existed, with artisans mastering skills in goldsmithing and copper and iron work. Other industrial activity included silk and ceramics production for local use and regional trade. Paper-making and glass-making techniques were also introduced during Chinese rule. Water power was harnessed at a small scale on many rivers, with water wheels used to pump water for irrigation (Figure 2).



Figure 2: Water wheels were once common features of rivers in Viet Nam. This extraordinary cluster survives on the river in Binh Chuan, Con Cuong District in northern Viet Nam. Photograph by KoheiU (2025)

From 1858 to 1954, the French colonisation fundamentally altered Viet Nam's economic structure. The colonisers focused particularly on the extraction of raw materials and the creation of a domestic market for French goods. In cities, there was investment in infrastructure such as Cầu Mống (Mong Bridge) in Saigon, which was completed in 1894 (Figure 3). Many towns and cities also benefitted from the construction of markets. Examples include the Dong Xuan Market in Hanoi in 1889 (Figure 4) and the Ben Thanh Market in Saigon (now Ho Chi Minh City) in 1912 (Figure 5). In the North, manufacturing and mineral extraction was established, including coal, iron, and nonferrous metals. A shipbuilding industry was also established in Saigon (also known as Arsenal de Saigon).



Figure 3: Mong Bridge (Cầu Mống), Ho Chi Minh City. Previoiusly known as *Pont des Messageries Maritimes*, it spans the Bến Nghé River and was built in 1893-1894 by the French construction company Levallois Perret (a company formerly led by Gustav Eiffel). It was dismantled, renovated and re-erected as a pedestrian-only bridge in 2005. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO

In the South, plantation agriculture was more prevalent, with an emphasis on exporting rice and rubber. Across the country, infrastructure like railways, roads, and power stations were constructed. Good surviving examples from the development of the railways include the Long Biên Bridge in Hanoi (Figure 6), which was built between 1899 and 1902, and Da Lat Railway Station, which opened in 1932, the current building dating from 1938 (Figure 7). Early examples of colonial era Hydroelectric Power schemes included AnKroet, which dates from 1945 and is still operating (Figure 8).



Figure 4: Dong Xuan Market, Hanoi, which dates originally from 1889 and is one of the oldest surviving markets from the French colonial period. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO



Figure 5: Ben Thanh Market, Saigon. A reinforced concrete construction built in 1912, designed by French architects, Brossard et Maupin. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO

After independence from France in 1954, Viet Nam was divided into North and South, each adopting a different economic ideology. North Viet Nam pursued a socialist, centrally planned economy with a focus on heavy industry, supported by allies like the Soviet Union and China. This effort was severely disrupted by the Second Indochina War and U.S. bombings, which damaged critical infrastructure. South Viet Nam adopted a capitalist, market-based system that relied heavily on U.S. aid. The war subsequently devastated the national economy and resulted in significant loss of life and skilled labour, whilst also causing enormous environmental damage.



Figure 6: Long Biên Bridge, Hanoi, built between 1899 and 1902 by Daydé & Pillé of Paris, France. Seven of its 19 spans were destroyed by American bombing between 1968 and 1973, but these were replaced and the bridge still carries regular trains today. Photograph by Miles Oglethorpe (2018). CC-BY-SA 3.0 IGO

After reunification in 1975, the entire country transitioned into a centralised, planned economy. It was marked by severe difficulties and upheaval during which industrial and agricultural production initially stagnated, hampered by a heavy bureaucratic burden, high inflation, widespread poverty and mass emigration. The situation was also dogged by a continuing U.S. trade embargo and the loss of international aid because of new conflicts with Cambodia and China, all of which acted as a drag on an already damaged economy. As a consequence, by the mid-1980s, Viet Nam was one of the world's poorest countries and on the brink of socio-economic collapse.



Figure 7: Da Lat Railway Station, opened in 1932 but rebuilt and completed in 1938 to the design of French architects Moncet and Reveron. Photograph by Diane Selwyn (2011). Source: Wikimedia Commons



Figure 8: The dam of Suối Vàng, AnKroet Hydro Power scheme, which dates from 1945. The power station is still operating, has a peak capacity of 3.1 Megawatts and is owned by Viet Nam Electricity (EVN). Photograph by Dao Viet Cuong (2021). Source: Wikimedia Commons

In 1986, the Communist Party of Viet Nam therefore launched the Đổi Mới (Renovation) campaign, a major shift toward a socialist-oriented market economy. This radical change of policy combined government planning with free-market incentives, encouraging private business and foreign investment. This resulted in rapid Industrialisation, which included a shift in strategy from import substitution to exports, taking advantage of a large, skilled, and low-cost labour force. Viet Nam subsequently joined the World Trade Organization (WTO) in 2007 and signed numerous trade agreements, making it a global manufacturing hub for textiles, footwear, and electronics. Its economy rapidly moved beyond a dependence on raw materials (like coal, crude oil and agricultural products) to higher-value goods, with electronics accounting for an increasing share of exports. As a result, Viet Nam is now one of the world's fastest-growing economies, having transformed from an overwhelmingly agrarian society into a significant global industrial power.



Figure 9: Shortly after independence, this 1958 North Viet Nam banknote suggests an appreciation of industrial heritage through its depiction of a hydro power station dam (North Viet Nam Government, 1958). Source: Wikimedia Commons

National Heritage Inventory and System for Statutory Protection

Viet Nam has a national inventory for heritage, which is managed by the Ministry of Culture, Sports, and Tourism. This includes national registries for historical monuments and intangible cultural heritage. It also has nine UNESCO World Heritage sites, and seven more are on its Tentative List. None of these 16 sites is industrial. Meanwhile, Viet Nam is actively building a centralized, online national inventory of heritage, the intention being to use digital technologies, including GIS and 3D modelling and AI. There is no evidence that industrial heritage is explicitly recognised as a category of heritage at this time.

Viet Nam also now has a comprehensive statutory system for heritage protection, primarily anchored in the Law on Cultural Heritage (2001, and amended in 2009). This regulates the management, safeguarding, and promotion of tangible heritage (monuments, relics, antiquities), but also protects intangible heritage such as traditional crafts, folklore and festivals. This was being supported by the enactment of a new Cultural Heritage Law in 2024. From 2025, this introduces management based on a national database and the digitisation of heritage data.

Dalat Train Station

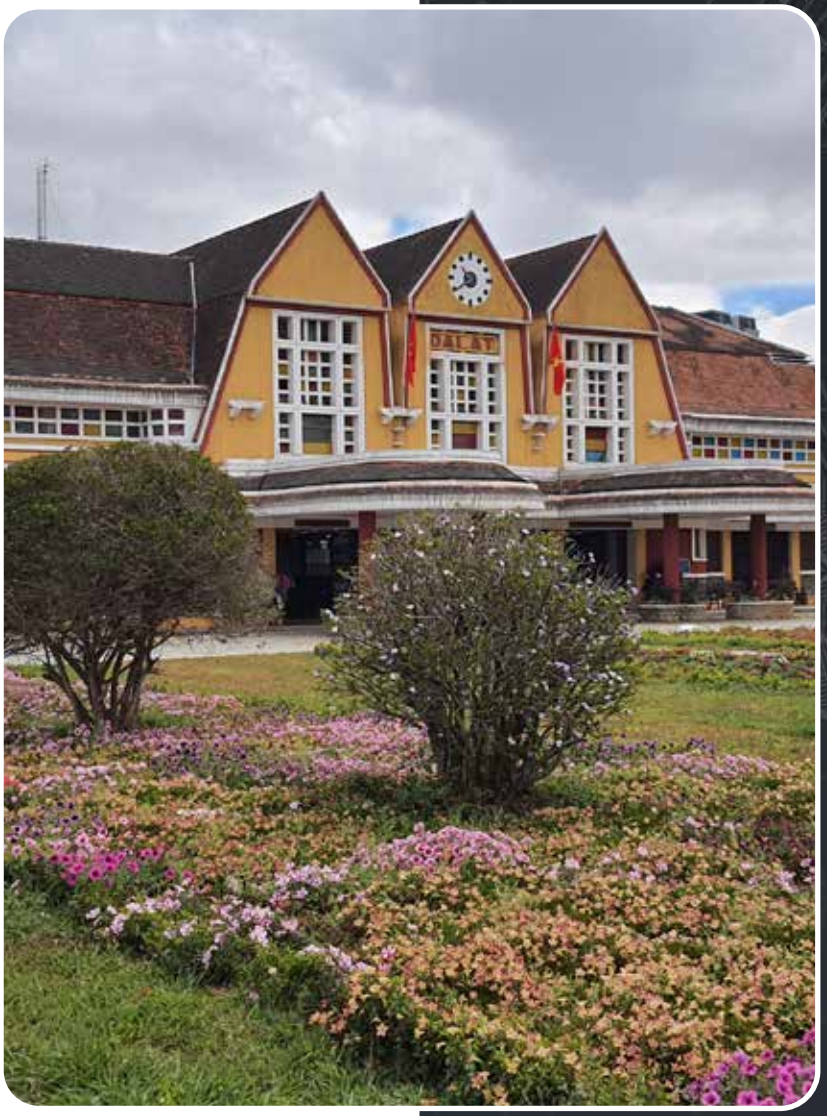


Figure 1: The main façade of the Dalat train station. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Contributor:
Truong Ngoc Lan
Member of Docomomo Vietnam
Lecturer of Faculty of Architecture and Planning, Hanoi University of Civil Engineering

State, Province, Region
Quang Trung Street, Ward 9, Da Lat City, Lam Dong Province, Viet Nam

Industrial classification
Transport

Further details on the industrial classification
The Da Lat Railway Station is a type of transportation infrastructure project. It is closely linked to the history of Da Lat's urban development as well as the history of railway technology in Viet Nam, particularly the unique Cogwheel railway technology in South-East Asia. Furthermore, the Da Lat Railway Station itself is a prime example of the adaptation of Western Art Deco architecture to suit the local culture, technology, and climate.



Figure 2: The platform of Dalat train station. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Brief description

Dalat Railway Station, designed by French architects J.P.R. Moncet and Revéron, was built in the 1930s. The station is a prime example of how the French adapted to the local context in Viet Nam. It served as the terminal station on the Cogwheel railway line from Phan Rang city, Ninh Thuan province (formerly) to Dalat city, Lam Dong province (formerly). The railway line started at Thap Cham station and ended at Dalat station, hence its other name, Thap Cham-Dalat. Dalat Station includes a covered platform for passengers, a machine workshop, and a warehouse. Currently, the station and the approximately 7km railway line from Dalat station to Trai Mat station are still in daily operation to serve tourists. The station's warehouse has been converted into a shop and refreshment stand.

The heritage value of Dalat Railway Station lies in its historical, technological, landscape, and architectural aspects. Technologically, Da Lat Station is part of the only Cogwheel railway in Viet Nam and the second in the world. The architecture of Da Lat Station is a prime example of the unique blend of Western Art Deco architecture with local Vietnamese cultural and climatic elements. The building's form reflects the characteristics of colonial Da Lat, with its high, sloping roofs covered in fired brick tiles and walls clad in natural stone. For both locals and tourists, the station is one of the most important structures contributing to Da Lat's distinctive urban landscape and has become one of its iconic landmarks.

Period(s) of operation

First period: 1938 (station) to 1972.
Second period: 1990's to present day (for tourists only).

Key events/chronology and changes to relevant attributes

1903: Construction began on the Thap Cham-Da Lat railway line.

1932: The railway was completed, with a total length of approximately 80km, including 14km of Cogwheel railway. Dalat station was designed.

1938: The station was inaugurated, serving both passenger and freight transport.



Figure 3: The warehouse of Dalat train station, nao tranform to the cafe. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

1972: The Thap Cham-Da Lat railway line, including Da Lat station, ceased operation due to the war.

Post-1975: The Thap Cham-Da Lat railway line was dismantled, and the station was abandoned.

1990s: Da Lat station and the line between Da Lat and Trai Mat resumed operation. Since then, the station has only served tourists.

2001: Da Lat station was listed by the Vietnamese government as a national historical and cultural relic.

Status of the research and historical documentation

The most significant and important research on Da Lat Railway Station is:

The creation of a dossier proposing its recognition as a National Cultural and Historical Monument in 2001 was prepared by the People's Committee of Lam Dong Province.

Besides the above dossier, there are currently very few specialized academic research on the Da Lat Railway Station. Information about Da Lat Railway Station includes research on the geography, heritage, and urban development of Da Lat, and the investigation of the Thap Cham-Da Lat railway line. Some of the main studies include:

1. Le Thi Hong Na, Do Huu Nhat Quang (2025), *Identifying the value of public architecture on the East-West heritage axis - Da Lat City,* Architecture Magazine (Viet Nam Association of Architects), No. 3-2025

2. Eric T. Jennings (2011) *Imperial Heights: Dalat and the Making and Undoing of French Indochina,* University of California Press.

3. Lam Dong Provincial People's Committee (2008), Da Lat Gazetteer, Ho Chi Minh City General Publishing House

In addition, documents related to Da Lat Railway Station and the Thap Cham-Da Lat railway line are currently stored at National Archives Centers 1 (Hanoi) and Center 4 (Dalat).

Current status and state of conservation

Dalat Railway Station is regularly maintained by the railway's management unit, and has been observed only with minor damage. In 2011 and 2021, the authorities carried out partial landscaping and cleaned up the station's machinery workshop. In 2014 and 2024, the authorities developed restoration projects and plans, but none have been implemented. Nevertheless, the structures, including the reception building, the covered platform, and the machinery workshop, retain most of their colonial-era components and continue to be used. The warehouse has been converted into a retail shop and cafe. Original equipment and machinery have been restored to serve tourism on a short 7km route within the city, and some sections of colonial-era Cogwheel railway tracks have been collected and displayed in the station.



Figure 4: Cogwheel railway tracks have been collected and are on display at Da Lat train station. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Known threats

Threats to this heritage site include the following issues:

The local rainy climate, and overtourism. In the future, further assessment may be needed regarding the threat to preserving the original features of the structure from the Langbian railway restoration project, including the Da Lat Station complex (the specific implementation plan is currently unclear).

Protection status

Da Lat Railway Station is a National Historical and Cultural relic, therefore it is protected according to the approved conservation plan and the Law on Cultural Heritage.

Registration status in the national or local inventory

Da Lat Railway Station has been listed as a National Historical and Cultural relic.

Ownership

The site is under the management of the People's Committee of Lam Dong Province, Viet Nam.

Gia Lâm Railway Factory



Figure 1: Main Pavilion of Hanoi Creative Design Week 2023 inside Gialam railway factory. Source: Architecture Journal, Vietnam Association of Architects

Contributor:
Thuy Loan, Pham
Docomomo Viet Nam
Asian Network of Industrial Heritage (ANIH)
Provisional chairwoman of Docomomo Viet Nam
ANIH's correspondent for Viet Nam

State, Province, Region
551 Nguyen Van Cu road, Hanoi city

Industrial classification
Engineering
Transport

Further details on the industrial classification
Founded in 1905, Gia Lâm Railway Factory was Viet Nam's first railway factory and one of the earliest in South-East Asia. It became a landmark of the nation's railways and a cradle of Hanoi's labor and revolutionary movements, where workers resisted colonial rule and fought for labor rights. Despite enduring seven U.S. air raids, it sustained operations after 1954, supporting the nation's reunification. Rebuilt in 1988 with Polish assistance, the factory also symbolizes international socialism solidarity and produced iconic achievements of Viet Nam's railway industry, including the Tồ Lồc (Self-reliance) steam locomotive and ồồi Mồi (Renovation) diesel locomotive.

Brief description

The Gia Lâm Railway Factory site is organised along an east–west axis, with two main entrances and an internal railway system connecting its facilities. The production zone comprises two clusters of workshops built in 1988 with support from the Polish government, reflecting the socialist bloc's ideals of internationalism, solidarity, and importance attributed to heavy industry.

At the centre of the grounds lies a green area featuring a sports field, pond, and water tower, balancing industrial production and social functions within the site. The pond functions as landscaping element, stormwater detention and regulating microclimate.

The Polish-built workshops are the most architecturally and technically valuable elements. They embody late-20th-century heavy industry design, with expansive structural systems that were among the most advanced in Vietnam at the time. Their large-span spaces are supported by composite steel girders, overhead crane systems, and distinctive sawtooth roofs. The workshop roofs were carefully oriented so that all openings face north–south, a deliberate climatic adaptation to reduce direct tropical sunlight and improve working conditions.

From a railway engineering perspective, Gia Lâm remains unique in Viet Nam as the only facility equipped to bring standard-gauge (1435 mm) trains directly into its workshops. This capacity underlines its enduring role in the nation's railway industry.

In sum, the site represents a significant phase in Viet Nam's industrial development during the socialist era, showcasing both international collaboration and technical advancement.



Figure 2: One of the main buildings in Gia Lam Railway Factory. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO



Figure 3: Interior of one of the main buildings, showing magnificent structures of these buildings. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO

Period(s) of operation

Established in 1905 under French colonial rule, Gia Lâm Railway Factory is one of South-East Asia's oldest railway facilities. Originally 50 hectares with 4,500 m² of workshops, it specialized in repairing steam locomotives and railcars. Over the last century, it underwent expansions, wartime destruction, and multiple reconstructions, notably in 1988 with Polish support. At its peak, it employed nearly 3,000 workers. Since 2003, it has operated as the Gia Lâm Railway Company, a State-owned enterprise. Production has declined since 2010, and following a 2017 relocation request, operations continue on a reduced 20-hectare site with about 300 employees.

Key events/chronology and changes to relevant attributes

1905: Established by the French colonial administration as Gia Lâm Railway Factory; covered 50 hectares with 4,500 m² of workshops; employed 300 Vietnamese and Chinese workers.

1940–1945: Occupied by Japanese forces during WWII; expanded to include weapons manufacturing.

1954: Taken over by the Democratic Republic of Vietnam; resumed operations with 430 workers.

1965: Workforce increased to 1,000; factory expanded by an additional 10 hectares.

1965–1968: Six U.S. bombings destroyed most original workshops; machinery relocated to evacuation sites.

1972: Factory, rebuilt after 1968, completely destroyed during the 12-Day Campaign.

1974: Factory restored for the second time.

1988: Full reconstruction funded by Poland; entered peak operational period with nearly 3,000 workers.

2003: Renamed Gia Lâm Railway Company; became an independent State-owned enterprise.

2010 onwards: Production declined sharply; workforce reduced to 300; operating area reduced to 20 hectares.

Status of the research and historical documentation

Several preliminary studies have assessed the heritage value of Gia Lâm Railway Factory, and these have been conducted by both social and professional groups.

In 2020, the Network for a Livable Hanoi surveyed ten industrial sites, including Gia Lâm.

The 2021 Hanoi Creative Space Design Competition featured multiple entries that selected the factory as a subject for research and design proposals.

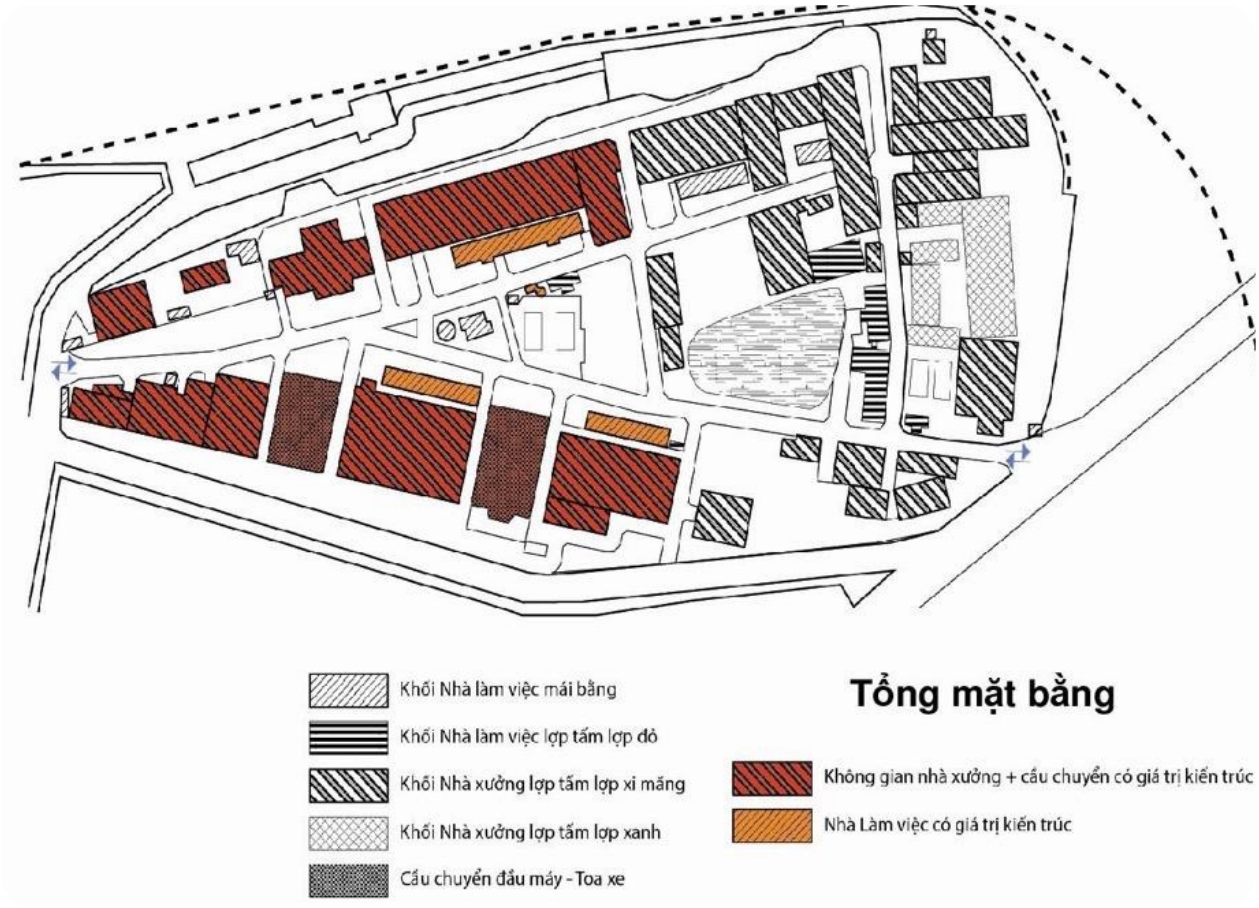


Figure 4: Overall layout of the factory's complex. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO

The Architecture Leaders Perspectives (ALP) 2023–2024 under the theme 'Urban Rejuvenation' chose the site for further study, proposing adaptive redevelopment strategies and programmes for the site.

These initiatives have significantly raised public awareness and strengthened heritage advocacy. Preliminary measured drawings of the factory's layout and buildings have been produced, providing an initial record of its architectural and spatial characteristics.

Notably, Hanoi Creative Week 2023 was held at Gia Lam railway factory from 17 to 26 November, attracting over 70,000 visitors. During the event, Railway Line No. 1 was temporarily operated to transport visitors from Hanoi Station to Gia Lâm Station, highlighting the site's operational and historical significance. These activities have further enhanced public recognition of industrial heritage, particularly railway heritage.

As a result, the Hanoi authorities are considering rezoning the factory site for public use rather than residential development, which could otherwise lead to the demolition of historic structures for new housing or commercial projects. Despite these efforts, the factory has not been officially recognised or legally protected under Viet Nam's Heritage Law or Law on Architecture. Consequently, no comprehensive heritage survey or documentation has been undertaken, leaving its status unresolved. While its cultural, technical, and historical significance is widely acknowledged, formal recognition is essential to ensure its preservation for future generations.

Current status and state of conservation

The factory, rebuilt in 1988, remains in good physical condition. A rapid assessment by the For a Livable Hanoi (VMHNĐS) team, based on basic criteria, indicates:



Figure 5: Gia Lam factory during the Hanoi Creative Design Week 2023. Source: Architecture Journal, Vietnam Association of Architects

Site area: very large
Quality of facilities: good
Operational status: limited/partial
Architectural value: excellent
Historical and social value: high

Concrete columns, steel trusses, and cladding structures are all in good condition.

However, the factory is not regularly maintained or conserved as a heritage site.

Known threats

Due to its large land area and central location, the site faces a significant risk of being rezoned for residential use, which could lead to the demolition of the factory for large-scale urban redevelopment projects.

A clear model for integrating industrial heritage conservation with creative space development—while generating financial resources for the site's operation and maintenance—has yet to be established.

At present, no legal or organisational framework for site management exists. The Gia Lâm Railway Joint Stock Company, under the Vietnam Railways Corporation and the Ministry of Transport, is the official owner; however, it lacks experience in managing heritage assets or creative spaces.



Figure 6: Art performance inside one of the main buildings in Gia Lam railways factory during the Hanoi Creative Design Week 2023. Source: Architecture Journal, Vietnam Association of Architects

Effective protection and promotion of the site will require close collaboration between different governmental levels, with the Hanoi municipal government and the Ministry of Transport under the State government.

Protection status
The factory has not yet been protected by any legislation at the national and/or local level.

Registration status in the national or local inventory
The factory was first listed among the Top 10 industrial sites of heritage value in Hanoi, based on a 2020 survey of 92 industrial facilities slated for relocation, conducted by experts from the For a Livable Hanoi network.

Within this list, the factory was recognised as the site with the most distinct heritage value.

However, it has not yet been officially included in the register of architectural works of value (under the Law on Architecture) or recognised as a heritage item under the Heritage Law.

It is important to note that the category of industrial heritage is not yet formally acknowledged within the framework of Viet Nam's Heritage Law

Ownership
Gia Lâm Railway Joint Stock Company / Vietnam Railways Corporation / Ministry of Transport.

Hanoi Brewery



Figure 1: Main Entrance of the Hanoi Brewery Factory. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO

Contributor:
Pham Thuy Loan
Docomomo Viet Nam
Asian Network of Industrial Heritage (ANIH)

Provisional chairwoman of Docomomo Viet Nam
ANIH's correspondent for Viet Nam

State, Province, Region
183 Hoang Hoa Tham Street, Hanoi city

Industrial classification
Food & Drink Processing

Brief description
Founded as the first brewery in Northern Viet Nam, Hanoi Brewery reflects the development of the beer industry, modern food production, and Hanoi's culinary culture. Its most iconic contribution is bia-hơi sidewalk stalls, which became a hallmark of the city's street life and a symbol celebrated in literature, art, and tourism. Economically, it was among the first state-owned enterprises to resume operations after 1954, with well-known draft-beer brands like Truc Bach, Hanoi, and Huu Nghi, playing a vital role in industrial recovery and early socialist development.

The Hanoi Brewery complex comprises dozens of buildings that were constructed across multiple phases, and are organised into two main zones: administrative and production.

The administrative zone features two- to three-storey villas within landscaped grounds, modeled after European garden villas. Three pre-1945 buildings hold architectural value, most notably the former residence of the Hommel company. This three-storey house, with its stone-clad ground floor and steep timber-supported roof, illustrates the integration of managerial housing within industrial sites—a planning model typical of French facilities in Viet Nam before 1945.

The production zone contains buildings ranging from the pre-1945 era to the early 21st century. Three hold particular value, especially the current purified water bottling hall (late 1920s–1940s). Designed in a simplified Art Deco style, it combines restrained decoration with technical sophistication. Features include geometric Art Deco stripes, ventilated doors, and a reinforced concrete truss roof system with a distinctive W-shaped profile. This structural system, monolithically cast with columns, reflects advanced French engineering solutions for large-span industrial spaces.



Figure 2: The Hanoi Brewery Factory layout. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO



Figure 3: The Former Hommel Brewery Owner's Villa within the Brewery Compound (current site). Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO

The site stands out for its integration of residential, administrative, and industrial functions within one unified campus. This spatial model, especially evident in the administrative zone, distinguishes Hanoi Brewery from other industrial complexes in the city, making it a unique example of early 20th-century industrial planning.

Therefore, concerning its heritage value, the Hommel residence and the Art Deco bottling hall embody both artistic and technical achievements. Together, they highlight the brewery's role as a cultural and industrial landmark, representing French industrial heritage adapted to Hanoi's climate and context.

Period(s) of operation
It has operated from 1890 to the present. It is currently the Headquarters of HABECO (Hanoi Beer – Alcohol – Beverage Corporation).

Key events/chronology and changes to relevant attributes
1890: Establishment of Hommel Brewery, the predecessor of Hanoi Brewery.

1954: Operations ceased when the French dismantled the machinery and shipped it back to France.

1957: Restored under the new government and renamed Hanoi Brewery.

1958: Produced its first brand after restoration – Truc Bach Beer.

1993: Reorganised into Hanoi Brewery Company.

2003: Formation of Hanoi Beer – Alcohol – Beverage Corporation (HABECO).

2006: Most production facilities were relocated to Me Linh, forming Hanoi – Me Linh Brewery.

2008: Equitization.

2017: Establishment of Hanoi – Hoang Hoa Tham Brewery.

Status of the research and historical documentation
To date, no official or in-depth research has been conducted on this site from a heritage perspective.

In 2020, the Network for a Livable Hanoi (socio-professional network) carried out a survey assessing the heritage value of ten industrial facilities in Hanoi, including the Hanoi Brewery. However, the outcomes remained very preliminary, limited to basic assessments and a preliminary master plan.

The managing entity (HABECO) may possess certain documentation related to the assets and facilities, but such materials have not been made publicly available. No systematic archival research on this property has yet been undertaken in public repositories.

Current status and state of conservation
As the headquarters of HABECO, the property remains in good operation and is regularly managed and maintained by its governing body. However, no formal inventory and documentation efforts have been conducted for this property

Known threats
The most urgent and critical risk facing this property is that the Hanoi's Authority has included the factory in the list of facilities scheduled for functional relocation within the next five years (by 2030). The subsequent step will be to rezone the land, most likely for residential use. Inevitably, this will negatively affect both tangible and intangible heritage associated with the property to make way for new housing and commercial developments.

Protection status
The property is not yet protected by any legislation

Registration status in the national or local inventory
The property is not yet registered in any list for protection

Ownership
Hanoi Beer – Alcohol – Beverage Corporation (HABECO) / Ministry of Industry and Trade



Figure 4: Interior in Art Deco–style of Production Building for Purified Water Line. Photograph by Pham Thuy Loan. CC-BY-SA 3.0 IGO

Hoa Binh Hydroelectric Power Plant

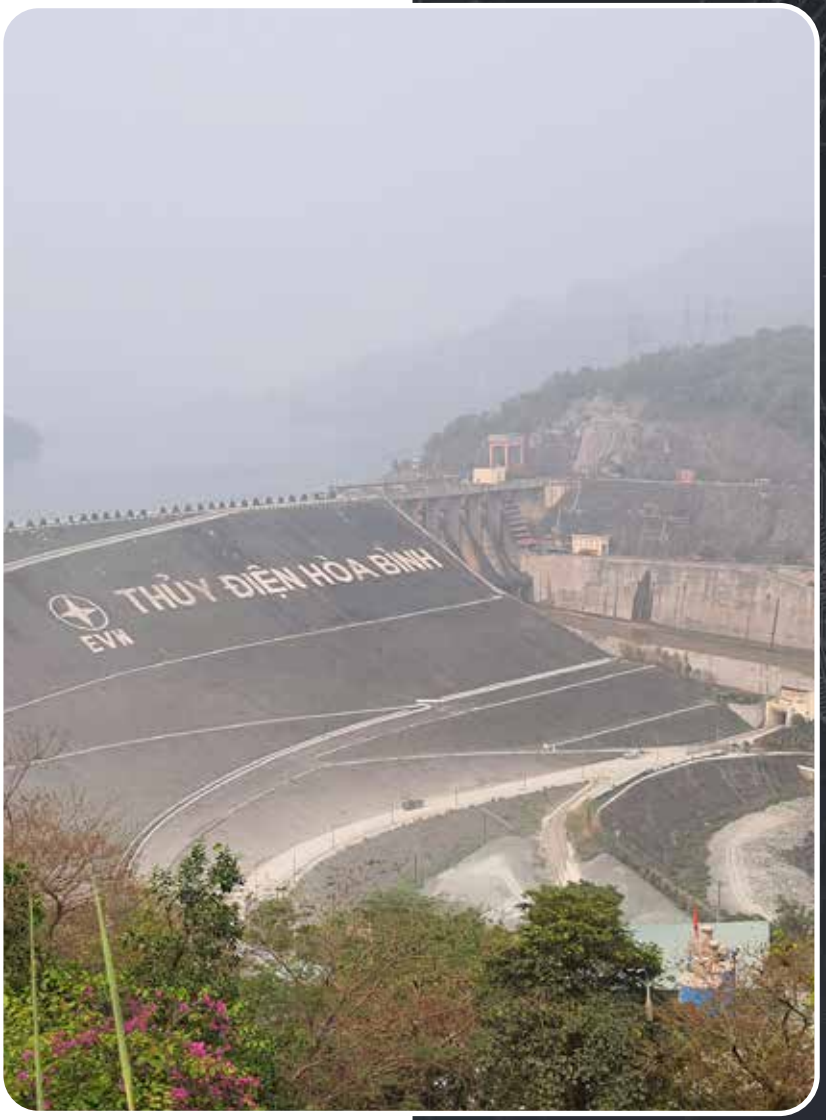


Figure 1: The dam of the Hoa Binh hydroelectric power plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Contributor:
Truong Ngoc Lan
Member of Docomomo Viet Nam
Lecturer of Faculty of Architecture and Planning, Hanoi University of Civil Engineering

State, Province, Region
Hoa Binh Province, Hoa Binh City, Phuong Lam Ward

Industrial classification
Energy

Further details on the industrial classification
The Hoa Binh Hydroelectric Power Plant functions to generate electricity and regulate water for the Da and Red River basins. The hydroelectric plant not only supplies electricity to the North but, along with the 500kV transmission line system, also played a crucial role in addressing electricity shortages in the south of Viet Nam during the 1990s, while significantly mitigating flooding in the Red River basin. The project brought about fundamental changes in Viet Nam's energy production and irrigation in the North at the end of the 20th century.

Brief description
The main components of the power plant include the following:

(1) The reservoir (Hoa Binh Reservoir), storing water from the Da River, is the largest artificial reservoir in Viet Nam, with a capacity of 9.45 billion cubic meters of water. During the flood season, 50% of the water in the Red River comes from the Da River. Therefore, Hoa Binh Reservoir helps both store water for power generation and regulate floods in the Red River Delta.

(2) The dam, 734 m long and 128 m high, has 12 spillway gates. The dam and Hoa Binh Reservoir have created a new and distinctive landscape for the area.

(3) The underground power plant in the mountain has 8 generating units, each with a capacity of 240 MW.

Other components include the transformer system, the power distribution station, the water diversion tunnel system and the operation tunnel, the control building, the museum, the commemorative monument system, and the workers' housing area.

The heritage value of the power plant lies in the site's political and diplomatic history, science and technology (in underground construction and irrigation), architecture, and its landscape. The site also serves as a prominent example reflecting a special historical period when Viet Nam was determined to develop according to a socialist-style centralized economic model with the support of the Soviet Union. The completion of the power plant marked important historical achievements in science and technology for the electricity, construction, and irrigation sectors in Viet Nam. The architecture and decorative artworks of the factory reflect this fusion of socialist modern style with Vietnamese elements, helping to preserve the memory of a special period in Vietnamese history. The Hoa Binh Hydroelectric Power Plant has become a 'living heritage' and a famous tourist destination in Viet Nam.



Figure 2: The administrative office of the Hoa Binh hydroelectric power plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO



Figure 3: The tunnel houses the generators of the Hoa Binh hydroelectric power plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Period(s) of operation
The Hoa Binh hydroelectric power plant began construction in 1979, the first generator unit started operating in 1988, and the plant was officially completed in 1994. The plant is still in operation today and has been expanded to continue operating for many more decades.

Key events/chronology and changes to relevant attributes
1971: Site survey and exploration for power plant construction begins.

November 6, 1979: Construction commences.

January 12, 1983: Construction of the first phase of the Da River dam begins.

January 9, 1986: Construction of the second phase of the Da River dam begins.

December 30, 1988: First generator unit starts generating electricity.

December 20, 1994: Power plant inaugurated.

August 1, 2016: The Prime Minister signed Decision No. 1528/QD-TTg approving the overall development plan for the Hoa Binh Lake National Tourist Area in Hoa Binh province until 2030. Hoa Binh Lake is an inseparable component of the Hoa Binh hydroelectric power plant complex.

March 25, 2021, the Prime Minister issued Decision No. 439/QD-TTg approving the general planning for the construction of the Hoa Binh Lake National Tourist Area in Hoa Binh province until 2035.

Status of the research and historical documentation

To date, there are no academic studies on the Hoa Binh Hydroelectric Power Plant from an industrial heritage approach; most studies focus on technical, historical, and memoir aspects in Vietnamese and Russian. Studies in English that mention the Hoa Binh hydroelectric power plant mainly address economic, political, and environmental issues. Books, scientific articles, and articles on the Hoa Binh hydroelectric power plant on the official website and in the press of Vietnamese state agencies currently highly value the historical, scientific, technological, landscape, and social impact of the project in its context.

Main studies include:

V. Sklyarenko; O.D.Zvyagin (2022) Two Underground Hydroelectric Power Plants of Vietnam. Science and Technology Publishing House. Hanoi.

Duong Trung Quoc (editor) (2014) The Vietnamese Electricity Industry - Chronology of Events - Documents. Volume 1 - 1894 – 1995. Truth Publishing House. Hanoi

Current status and state of conservation

Currently, the Hoa Binh Hydroelectric Power Plant is still operational, supplying electricity, regulating water levels, and serving as a tourist attraction. Its main components are well-preserved, retaining the original features of most of its parts.



Figure 4: The tunnel houses the generators of the Hoa Binh hydroelectric power plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO



Figure 5: Socialist modern art style mosaic mural at Hoa Binh hydroelectric power plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Known threats
Because it has not yet been recognised as a historical site, the factory's heritage values may be affected by future repair, renovation, and expansion activities.

Protection status
Although not yet listed as a historical site, the Hoa Binh Hydropower Plant is located within the Hoa Binh Lake National Tourist Area and is therefore protected under the 2017 Tourism Law No. 09/2017/QH14 and the General Planning of the Hoa Binh Lake National Tourist Area. Furthermore, as a vital energy infrastructure, the plant has clearly defined protection boundaries and is protected under relevant laws such as the 2004 National Security Law No. 32/2004/QH11, the 2012 amended Electricity Law No. 24/2012/QH13, and the 2023 Water Resources Law No. 28/2023/QH15.

Registration status in the national or local inventory
The property is not yet registered in any list

Ownership
The Hoa Binh Hydroelectric Power Plant is owned and managed by the Vietnam Electricity Group (EVN)

Long Bien Bridge

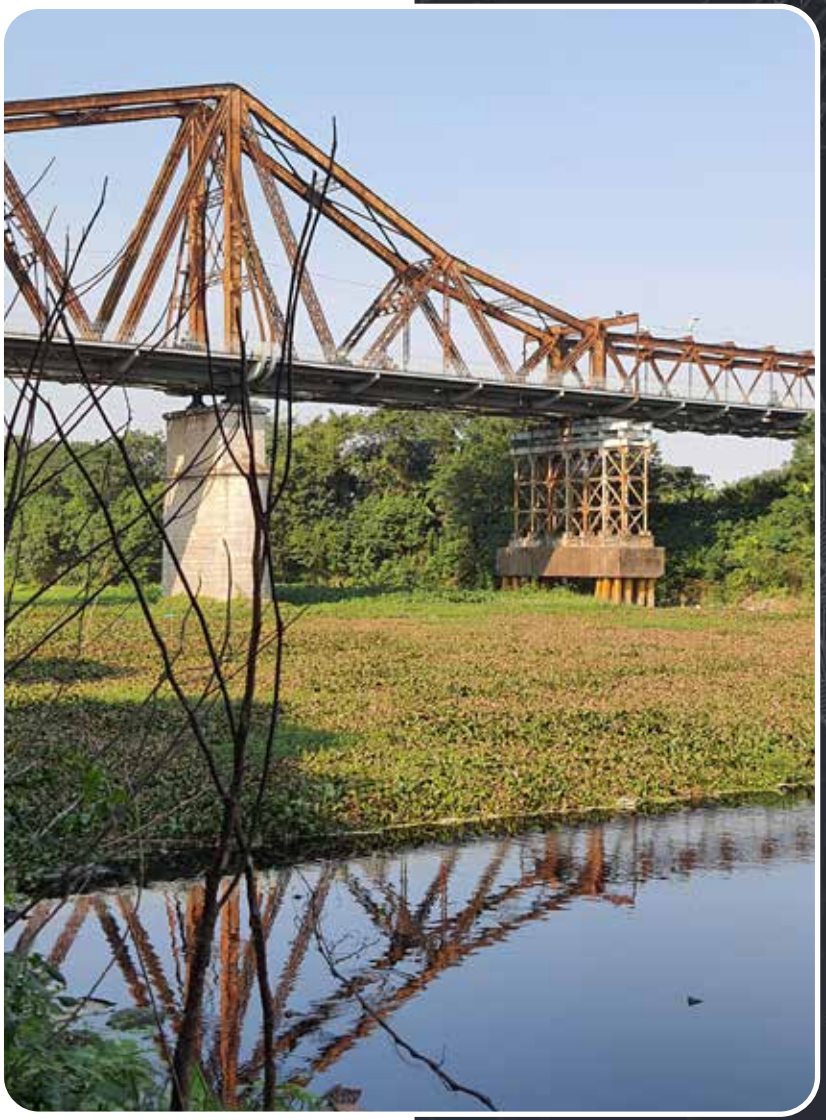


Figure 1: The main section of the Long Bien Bridge. Author: Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Contributor:
Truong Ngoc Lan
Member of Docomomo Vietnam
Lecturer of Faculty of Architecture and Planning, Hanoi University of Civil Engineering

State, Province, Region
Hanoi city
Hoan Kiem ward and
Bo De ward

Industrial classification
Transport
Infrastructure

Further details on the industrial classification
Completed in 1902, the Long Bien Bridge was the first modern steel bridge across the Red River in Hanoi, and also the largest road and railway bridge in Viet Nam during the French colonial period. It is also one of the oldest steel bridges still in operation in Viet Nam. The Long Bien Bridge has become an iconic image in Hanoi's urban landscape and the Red River landscape, closely associated with Hanoi's urban development history and the memories of many generations of Hanoians.

Brief description

The Long Bien Bridge (originally named Paul Doumer Bridge), designed and constructed by Dayde & Pillé company, has a main steel bridge body 1,682m long supported by 20 concrete pillars, each 44m high (including foundation), with 30m below water level. At both ends of the bridge are access ramps for vehicles. The main bridge body has a railway line in the middle, flanked by lanes for cars, motorcycles, bicycles, and pedestrians. Initially, when inaugurated in 1902, the bridge only had a railway line. Construction of the lanes for vehicles and pedestrians began in 1922 and officially opened in 1924. Each side has a 2.2m wide road for vehicles and a 1m wide sidewalk. There are four bypass sections, each 15m long and 4.2m wide. During the war against the US, the bridge was bombed, resulting in the damage of many spans. These were replaced with structures different from the original. The Long Bien Bridge is also connected to the Long Bien Railway Station at the western end of the bridge and the arched stone railway viaduct within the city, built at the same time, forming an inseparable heritage complex.

The Long Bien Bridge is intertwined with the modern history of Hanoi through colonial periods, war, and peace. The Long Bien Bridge is one of the first major modern infrastructure projects built in Hanoi, one of the longest steel bridges in the world at the time of its construction and was an important component of the Hanoi-Yunnan railway line built by the French colonialists, marking a milestone in the development of science and technology in Viet Nam in the early 20th century. For more than eight decades since its construction, it has been the only bridge connecting Hanoi with localities on the other side of the Red River, thus becoming deeply intertwined with the lives and memories of the community, a prominent landmark along the Red River, and one of Hanoi's most important symbolic images.



Figure 2: The main section of the Long Bien Bridge. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO



Figure 3: The main section of the Long Bien Bridge. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Period(s) of operation

Since 1902 until the present.

Key events/chronology and changes to relevant attributes

1897: The colonial government held a tender for construction and design; Dayde & Pillé won the bid.

1898: The colonial government held a groundbreaking ceremony.

1899: Construction began.

February 28, 1902: The bridge (railway section only) was inaugurated; it was officially named Paul Doumer Bridge.

1922: Construction began on the bridge expansion, including lanes for vehicles and pedestrians on both sides of the railway.

1924: The bridge expansion was inaugurated.



Figure 4: Ramp for vehicles to access the bridge. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

1945: The Japanese army overthrew the French colonial government in Indochina. The new mayor of Hanoi, Tran Van Lai, renamed the Paul Doumer Bridge to Long Bien Bridge.

October 9, 1954: The last French military units withdrew from Hanoi via the Paul Doumer/Long Bien Bridge.

Between 1965 and 1972: The bridge was bombed 14 times by the US Air Force, damaging many spans

2014: The Vietnamese Prime Minister proposed preserving the Long Bien Bridge, and the Hanoi Department of Culture, Sports and Tourism proposed classifying the Long Bien Bridge as a national historical and artistic monument.

2024: The French Government funded a research project on the renovation of the Long Bien Bridge through the FASEP Fund.

Status of the research and historical documentation

To date, there have been many studies on the Long Bien Bridge in its role as a heritage site. In 2014, the Hanoi Department of Culture, Sports and Tourism submitted a dossier proposing the recognition of Long Bien Bridge as a national historical monument.

Several important studies and workshops in recent years include:

The National Archives Center I, December 2022, Exhibition 'Long Bien Bridge – A Witness to History'.

The Viet Nam Urban Planning and Development Association, the Association for Liaison with Overseas Vietnamese, the National Archives Center I, and the Long Bien Bridge Investment and Development Consulting Company jointly organised, on October 25, 2023, the scientific workshop 'Innovation in Planning, Preservation, Restoration, and Promotion of the Value of Long Bien Bridge' at the National Archives Center I.



Figure 5: Railway viaduct for trains to access Long Bien Bridge. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

The Economic Department of the French Embassy in Viet Nam, through the FASEP Fund of the French Ministry of Economy and Finance, 2024, Technical Assistance Project 'Research on the Renovation of Long Bien Bridge'.

The Hanoi People's Committee and the French Embassy in Viet Nam will jointly organise the international workshop Research on the Renovation and Promotion of the Historical and Cultural Value of Long Bien Bridge' on September 16, 2025.

Original documents on Long Bien Bridge include design files from Dayde & Pillé company and related documents from the colonial government, currently stored at the National Archives Center 1, Hanoi.

Current status and state of conservation
Apart from the eight war-damaged spans that have been replaced with new structures, the majority of the bridge's structure remains original from the colonial era, comprising 11 steel spans, most of the piers, and the approach roads at both ends. The bridge continues to operate daily with full functionality as originally intended. While the structure has deteriorated, there have been no major comprehensive restoration projects, only routine maintenance and repairs.

Known threats
The biggest threats to the heritage site include deterioration due to vehicle activity and weather affecting the integrity of the heritage site. Furthermore, the new railway bridge project parallel to the Long Bien Bridge (currently under study) could affect the surrounding landscape and have a visual impact on the bridge.

Protection status
The Long Bien Bridge has not yet been listed as a historical monument and therefore is not officially protected by legal regulations on heritage.

Registration status in the national or local inventory
The property is not yet registered in any list for protection

Ownership
The Long Bien Bridge is currently directly managed by the Ministry of Transport

Thu Duc Water Treatment Plant



Figure 1: Surge Tank of the water supply system from the Thu Duc Water Treatment Plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Contributor:
Truong Ngoc Lan
Member of Docomomo Vietnam
Lecturer of Faculty of Architecture and Planning, Hanoi University of Civil Engineering

State, Province, Region
Number 2, Lê Văn Chí, Thu Đuc ward, Ho Chi Minh city, Viet Nam

Industrial classification
Infrastructure

Further details on the industrial classification
The Thu Duc Water Treatment Plant is the first modern, industrial-scale surface water treatment plant in Southern Viet Nam, marking a significant shift from dispersed groundwater extraction to a centralized surface water management system.

Brief description
The Thu Duc Water Treatment Plant was part of the first industrial-scale surface water treatment system in Southern Viet Nam, completed in the 1960s. This included the Hoa An pumping station, the Thu Duc Water Treatment Plant, an underground fresh water storage system, as well as pipelines, and a pressure tower system.

The main components of the Thu Duc Water Treatment Plant were: a filtration and sedimentation system, a chemical treatment system, administrative buildings, warehouses, and technical facilities. Notably, the architecture of the administrative building is of high artistic value, transcending the image of a typical factory. Overall, the heritage value of the Thu Duc Water Treatment Plant lies in its historical, technological, and architectural aspects.

Notably, The Thu Duc Water Treatment Plant is one of the representative projects marking the transformation of Saigon-Ho Chi Minh City from a colonial-style city to a modern city with concentrated, large-scale infrastructure. In the 1960s, the Thu Duc Water Plant was also one of the most technologically advanced stations in Viet Nam, not only in treatment technology, but also in transmission as it used surge tanks. The plant's operating building was characterised by a modern tropical architectural style, one of the most typical examples of the flourishing modern architecture in Saigon at that time.

Period(s) of operation
Inaugurated in 1966, it operated under the management of the Republic of Viet Nam government until 1975. From 1975 to the present, it has operated under the management of the Saigon Water Supply Corporation (SAWACO), a state-owned enterprise of the Socialist Republic of Viet Nam.

Key events/chronology and changes to relevant attributes
1961: The project to exploit water from the Dong Nai River has been approved, including the construction of a water treatment plant.

1966: The Thu Duc Water Treatment Plant was inaugurated, with a capacity of 450,000 m^3/day.

1982: The plant has increased its capacity from 450,000 m^3/day to approximately 560,000 m^3/day.

1995: The plant's capacity was further increased to 650,000 m^3/day.

2002: The plant's capacity was further increased to 750,000 m^3/day.



Figure 2: Main facade of Thu Duc Water Treatment Plant. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Status of the research and historical documentation
There have been no specific studies on the heritage value of the Thu Duc water plant. However, the plant is always listed as an important case study in many scientific publications on urban architectural heritage in Ho Chi Minh City.

A representative international study is:
S. Maramatsu, Y. Yamana, & W. Johannes, et al, *mASEANa: Appreciating modern ASEAN architecture*. DOCOMOMO Japan. 2024.

Current status and state of conservation
Currently, the Thu Duc Water Treatment Plant is in good condition and is still operational, with the most important parts still remain.

Known threats
There is no threat to the Thu Duc Water Treatment Plant

Protection status
Currently, the Thu Duc Water Treatment Plant is not protected as a heritage site. The plant is protected by the government as a particularly important infrastructure facility.

Registration status in the national or local inventory
The Thu Duc Water Treatment Plant is not yet included in the national or local heritage list.

Ownership
The site is operated under the management of the Saigon Water Supply Corporation (SAWACO)

Mống Bridge

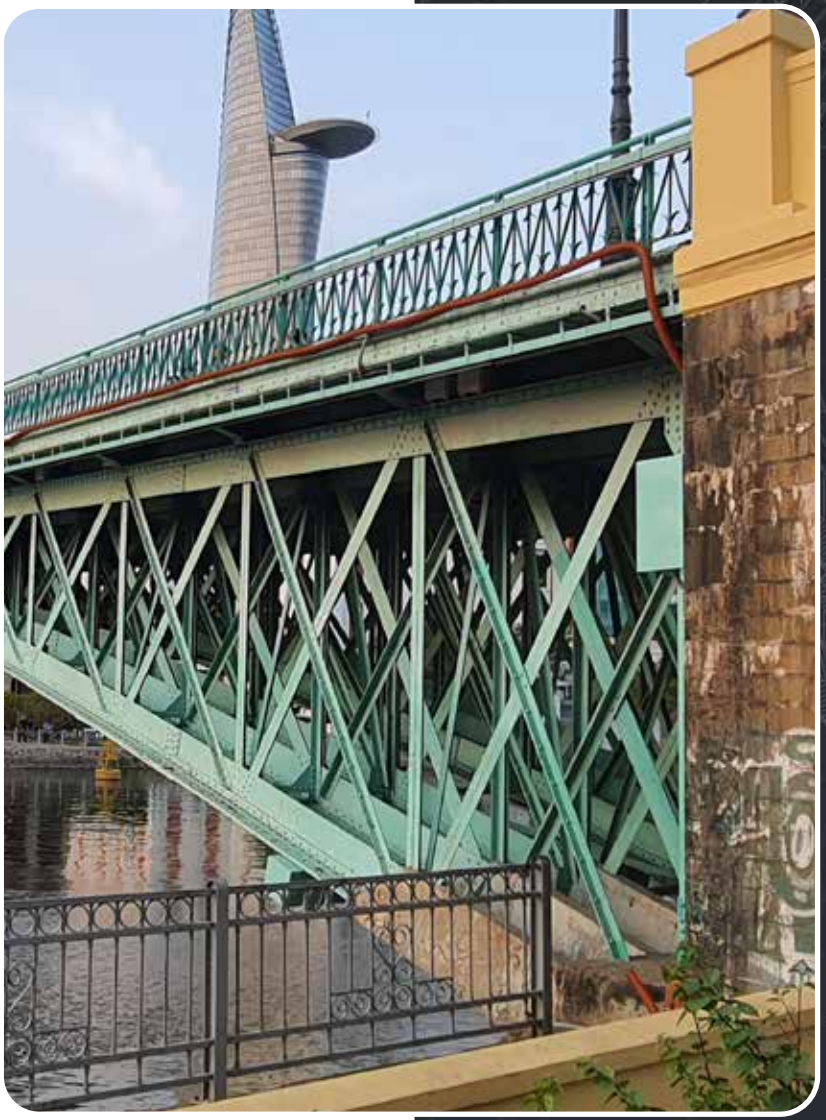


Figure 1: West facade of Mong bridge, view from Ben Van Don street. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Contributor:
Truong Ngoc Lan
Member of Docomomo Vietnam
Lecturer of Faculty of Architecture and Planning, Hanoi University of Civil Engineering

State, Province, Region
Vo Van Kiet Street and Ben Van Don Street, Ho Chi Minh City, Viet Nam

Industrial classification
Infrastructure
Transport

Further details on the industrial classification
The Mống Bridge is one of the very few structures of the Eiffel company that remain almost in their original state in Viet Nam. This is also one of the oldest steel bridges in Saigon – Ho Chi Minh City, as well as in all of Viet Nam.

Brief description
The Mống Bridge (originally called Messageries Bridge in French) was built by the Saigon branch of the Eiffel company for *Messageries Maritimes* to transport goods. Constructed in 1882, the bridge is a parabolic arch structure 128 meters long and 6.20 meters wide, comprising a 5.2-meter carriageway and two sidewalks, each 0.5 meters wide. Previously, the bridge was used by both vehicles and pedestrians, hence the ramp for vehicles. However, after 2025, the ramp was removed due to changes in the area's traffic system planning. Currently, there are staircases at both ends of the bridge for pedestrians.

To this day, the bridge remains functional as a pedestrian bridge and is equipped with artistic lighting to serve visitors and contribute to the Saigon River's nighttime landscape.

The heritage value of the Mống Bridge lies in its historical, urban landscape, and engineering aspects. The Rainbow Bridge is the oldest operational steel bridge in Saigon, marking the entry of Western technology into Viet Nam in the late 19th century. It is a rare example of a steel arch bridge structure remaining in Viet Nam. The bridge is one of the important physical evidences marking the period of urban development, infrastructure expansion, and commerce of Saigon under colonial time. At the same time, the Rainbow Bridge is also a beautiful landscape feature, etched in the memory of the local community.

Period(s) of operation
From 1882 to 2005, it functioned as a bridge for both vehicles and pedestrians.

From 2005 to 2011, it was dismantled and restored.

From 2011 to the present, it functions as a pedestrian bridge and tourist attraction.

Key events/chronology and changes to relevant attributes
1882: The bridge was built (according to information from the *Association des Descendants de Gustave Eiffel*).

2005: The bridge began to be dismantled for preservation during the construction of the Thu Thiem Tunnel project and were planned to be reinstalled in their original location after the Thu Thiem Tunnel project was completed.

2011: The Mong Bridge was fully restored to its original location and operates as a pedestrian bridge.

2014: The bridge was listed as a City-level Architectural and Artistic relic by the People's Committee of Ho Chi Minh City.

Status of the research and historical documentation
The most important research on the Rainbow Bridge consists of two documents:

The dossier on the restoration of the Rainbow Bridge (the compiling agency and storage location are unclear).

The dossier on the relic compiled and stored by the Department of Culture, Sports and Tourism of Ho Chi Minh City. Besides these two documents, there are no major academic studies specifically dedicated to the Rainbow Bridge, but the bridge is always listed as an important case study in many scientific publications on urban architectural heritage in Ho Chi Minh City. A representative international study is: S. Maramatsu, Y. Yamana, & W. Johannes, et al, *mASEANa: Appreciating modern ASEAN architecture*. DOCOMOMO Japan. 2024.



Figure 2: East facade of Mong bridge, view from Ben Van Don street. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO



Figure 3: North facade of Mong bridge(stair for pedestrian view from Vo Van Kiet street. Photograph by Truong Ngoc Lan. CC-BY-SA 3.0 IGO

Current status and state of conservation
Currently, the Mống Bridge is in good condition and is still operational. Although the original structure of the access ramp to the bridge for vehicles has been demolished, most of the original steel structural components of the bridge, the most important part, still remain.

Known threats
There is no threat to Mong Bridge.

Protection status
The Mong Bridge was listed as an City-level Architectural-Artistic Relic since 2014, therefore, it is now protected under Vietnam's Cultural Heritage Law.

Registration status in the national or local inventory
The Mong Bridge was listed as an City-level Architectural-Artistic Relic

Ownership
The site is under the management of the People's Committee of Ho Chi Minh city, Viet Nam.



Cambodia

Contributors:

Malen Chung
Independent Researcher
Architect

Sakona Loeung
Independent Researcher
Architect

National Industrial Narrative

Like many South-East Asian countries, Cambodia evolved from an ancient economy based on trade and agriculture to a more modern one shaped by socio-political change, Western colonial influence, and global integration. This long and uneven process can be traced through key historical periods that laid the foundations for, disrupted, or reshaped its industrial development.

In early times, Cambodia was recognised as a vital centre of regional trade and craftsmanship, which provided an early basis for organised production. This role peaked between the 8th and 14th centuries, when Angkor emerged as a vast urban centre. Its sophisticated hydraulic systems enabled intensive agricultural production to support a large population, while grand temples, workshops, and administrative institutions anchored a complex economy. These achievements reflected a highly organised society capable of large-scale construction and production, offering a distant precedent for later industrial ambition.

Following Angkor's decline, Cambodia entered a long period of fragmentation and transition until French colonisation. During this era, although resource exploitation continued, urban development and infrastructure investment were limited. Rural areas remained reliant on traditional agriculture, but emerging towns became modest centres for agricultural processing, workshops, and trade. This created the early framework for local manufacturing and trade networks that would later support industrialisation.

The French colonial period accelerated these changes by investing in transportation infrastructure and integrating Cambodia more deeply into global markets. In the early 1900s, the French built a railway linking Phnom Penh to Battambang, a key rice-producing and resource-rich province. By 1942, the Northern Railway stretched 386 km to the Thai border, improving connectivity and enabling large-scale movement of goods. The Mekong River also served as a critical artery for transporting resources from the interior to Phnom Penh, which functioned as the main



Figure 1: In the upper register of the East Gallery of the Bayon (Angkor), a figure is transporting construction materials, highlighting the organised labour that supported Jayavarman VII's monumental building projects. Photograph by Jean-Pierre Dalbéra. Source: Wikimedia Commons. CC BY 2.0

port before goods were shipped to Europe. This period saw Cambodia more systematically exporting timber, rubber, and other resources, setting the stage for more centralised and large-scale production in the future. These infrastructural foundations helped enable Cambodia's first significant phase of industrialisation during the 1960s, a moment often regarded as its "Golden Age" under Prince Norodom Sihanouk and the Sangkum Reastr Niyum regime. Seeking economic self-sufficiency and modernisation, the government led a concerted push to develop industry. By 1967, there were around 3,500 small- and medium-sized enterprises, along with about 30 large industrial establishments (Norodom, 1993). Industrial policy emphasised import substitution, state-owned enterprises, and infrastructure development in hydropower, roads, and ports. Phnom Penh's role as the main industrial hub of the country gained traction.



Figure 2: Example of a water pump powered by a water wheel at Siem Reap.Photograph by Luis Bartolomé Marcos (2014). Source: Wikimedia Commons. CC BY-SA 4.0

Key industries included textiles and garments; construction materials like bricks, tiles, and cement; food processing such as rice mills and sugar refineries; rubber-product factories; agro-industrial plants for paper and jute bags; extractive industries for glass and phosphates; mechanical assembly for vehicles; and water and energy systems, including hydroelectric and diesel power. This period represented Cambodia's most deliberate attempt to build a diversified industrial base.



Figure 3: Phnom Penh Railway Station, originally designed by Louis Chauchon. Its construction commenced in and was completed in 1932, but was refurbished in 2010. Photograph by Allie Caulfield. Source: Wikimedia Commons. CC BY 2.0



Figure 4: Phnom Penh Railway Station, interior. Photograph by Allie Caulfield. Source: Wikimedia Commons. CC BY 2.0

However, this momentum was violently interrupted by the Khmer Rouge regime, which took power in 1975. Their radical vision sought to eliminate money, trade, and private property, dismantling urban economies entirely in favour of a self-reliant agrarian model. Cities were emptied, industrial facilities abandoned or destroyed, and the population forced into collective agricultural labour on large-scale infrastructure like dams, reservoirs, and canals. Foreign aid and technological exchange were rejected to avoid perceived imperialist influence, resulting in regression rather than development.



Figure 5: Battambang railway station. Photograph by Malen Chung (2021). CC-BY-SA 3.0 IGO



Figure 6: The Etanou (or Rainbow or 'Old French') Bridge at Kampot, built in the 1920s from reinforced concrete. Photograph by Joe Mazzola (2011). (Source: WikiCommons. Source: Wikimedia Commons. CC BY 2.0



Figure 7: Phsar Thmei Central Market in Phnom Penh, designed by French architect Jean Desbois. Completed in 1937 and renovated in 2011. Photograph by Henning Blatt. Source: Wikimedia Commons. CC BY 3.0



Figure 8: Battambang Market, designed by French architect Jean Desbois. Completed in c.1937. Photograph by Lutz Maertens. Source: Wikimedia Commons. CC BY-SA 3.0



Figure 9: The Chup Rubber Factory, Kampong Cham, completed in 1961. Photograph by Ministère de l'Information. Source: Wikimedia Commons. Public domain



Figure 10: Asia Flour Mill in Phnom Penh, which is still in operation today. Photograph by Kim Sophanna (2024). CC-BY-SA 3.0 IGO



Figure 11: In the upper register of the East Gallery of the Bayon (Angkor), a figure is transporting construction materials, highlighting the organised labour that supported Jayavarman VII's monumental building projects. Photograph by Jean-Pierre Dalbéra. Source: Wikimedia Commons. CC BY 2.0

Following the Khmer Rouge's fall in 1979, Cambodia faced a devastated economy with ruined infrastructure, lost human capital, and only subsistence-level farming. Rebuilding efforts focused first on replacing destroyed institutions and physical infrastructure. Although the initial post-conflict period saw centralised planning, Cambodia gradually transitioned to a market-oriented economy. This shift attracted foreign investment, spurred the expansion of textiles and tourism, and helped drive significant GDP growth in more recent decades. Despite progress, challenges remain, including low domestic savings, a narrow industrial base, and limited financial infrastructure.



Figure 12: Part of the Asia Flour Mill complex.



Figure 13: Fermentation vessels (mash tuns) in the Khmer Society Distillery in the 1960s. Source: L'industrialisation du Cambodge, Photos-souvenirs du Cambodge Sangkum Reastr Niyum. Courtesy of The Documentation Center of Cambodia (DC-Cam) Archive. © DC-Cam Archive



Figure 14: Chroy Chongva Water Treatment Plant which was built during the French colonial period. Photograph by Malen Chung (2025). CC-BY-SA 3.0 IGO

Transnational Connections

Several connections between the domestic industry and other countries have been observed most notably in the industries of transportation such as the connection of railway Kampot, Phnom Penh, Battambambag, Poipet, to Thailand.

Cambodia also has important maritime routes connecting the Mekong and Tonle Sap rivers with trade routes from the Bay of Bengal to the southern provinces of China. Cambodia has two major ports, located in Phnom Penh and Sihanoukville. These hubs distribute Cambodian products to other countries and are key for importing goods from around the world into the country.

National Inventory or Database for the Country's Built Heritage

Cambodia has a formal inventory and database for its built heritage, which is managed by various establishments focused on significant monuments and buildings. For instance, the APSARA National Authority, an entity that under the Ministry of Culture and Fine Arts (MCFA) is responsible for the maintenance of the Angkor Archaeological Park, and its functions include carrying out extensive documentation of built heritage from urban, landscape to architecture scale. APSARA is responsible for the development of master-plans, archaeological reports, conservation guidelines, as well as for the urban and tourist development of the park. Aside from that, every provincial office of the Ministry of Culture and Fine Arts has its own official of cultural property inventory, although the coverage appears to be partial and uneven. The list of immovable cultural property referring to the French period and located in Phnom Penh old town was jointly developed by the Municipality of Paris and Phnom Penh Municipality.

The MCFA has led efforts in creating a nation-wide inventory for immovable cultural property to complement the lists created at provincial level, although to-date this is not public.

In addition, there are municipal and/or site-specific inventories, including:

- Inventory of the buildings within Phnom Penh old town available online which was published by the Parisian urban planning agency Apur and the Municipality of Paris. (https://archivesphotos.apur.org/)

- Online resources of Angkor including arts, archaeology, architecture, dance, music, religions and belief and more. (https://angkordatabase.asia/)

Industrial Heritage within the National Inventory

The national inventory does not include industrial heritage as a specific category.The Law on the Protection of Cultural Heritage by MCFA defined national cultural heritage as comprising cultural property which was created or discovered on national territory. The definition of "Cultural Property in Cambodia as any work produced by human agency and any national phenomenon of a scientific, historic, artistic or religious nature which bears witness to a certain stage in the development of a civilisation of the natural world and whose protection is in the public interest." (MCFA, 1996). However, the term 'industrial heritage' has not been defined in Cambodian law, scientific research or in academia. The way in which the definition and recognition of this typology of heritage emerges is certainly connected to how Cambodian civilisation, as well as its social and cultural aspects evolved over time.

National Statutory Protection for Built Heritage

Cambodia's system of statutory protection for its heritage is guaranteed primarily through the Law on the Protection of Cultural Heritage enacted in 1996. However, Industrial Heriage is unfortunatelynot part of the statutory protection for built heritage.

Royal Railway (Cambodia)



Figure 1: Railway platform in Phnom Penh. Photograph by Katorisi (2004). Source: WikiCommons. CC BY-SA 3.0

Contributors:
Malen Chung
Independent Researcher
Architect

Sakona Loeung
Independent Researcher
Architect

State, Province, Region
Cambodia

Industrial classification
Infrastructure
Railways



Figure 2: Phnom Penh main railway station. Photograph by Katorisi (2004). Source: WikiCommons. CC BY-SA 3.0

Brief description

The railway network, which extends across the country, plays an important role in transport and economic movement in the commercial sector. This includes not only the railway lines but also the main stations in Phnom Penh Centre and other subsidiary stations within each province across Cambodia.

During the French Colonial period, the Cambodian Railway construction occurred between 1929 to 1940. The railway network consists of two lines, the Northern Line and the Southern Line. The first railway was built by linking Phnom Penh to Battambang—a key rice-producing and resource-rich province, and to Poi Pet Pet (Cambodia-Thailand border) was constructed and functional between 1929 to 1942 during the French colonial period. This northern Railway has a length of 386 km from Phnom Penh. It improved connectivity and enabled large-scale movement of goods.

The second rail line from Phnom Penh to Sihanoukville, the city port at the south of Cambodia, was constructed between 1960 and 1969 and is a total length of 264 kilometres connecting Phnom Penh to Sihanoukville port. Both lines were severely damaged and partially destroyed during the war.

Currently, both lines are functional and maintained to the highest international safety standards in collaboration between Ministry of Public Works and Transport and Royal Railway of Cambodia (RRC) which provide the following services:

• Phnom Penh – Sihanoukville/ Sihanoukville – Phnom Penh

• Phnom Penh – Kampot/Kampot – Phnom Penh

• Phnom Penh – Takeo/Takeo – Phnom Penh

• Sihanoukville – Kampot/Kampot – Sihanouk Ville

• Sihanoukville – Takeo/Takeo – Sihanoukville

• Takeo – Kampot /Kampot – Takeo



Figure 3: Battambang railway station. Photograph by Christophe95 (2018). Source: WikiCommons. CC BY-SA 4.0



Figure 4: Sihanoukville railway station (2018). Source: WikiCommons. Author: Christophe95 CC BY-SA 4.0

Periods of operation

The construction of Northern Railway occurred between 1929 to 1942 during the French Colonial period. The Southern Rail line was built between 1960 to 1969. Royal Railway stations started to operate in 1929 and were suspended in 1970 because of the civil war. From 1980, the railways were reopened, but only for goods.

Protection and management

There is no formal, statutory protection and the railway does not feature in any local or national inventory. A short section of railway to the northern part was removed without replacement.

Ownership

In 2009, the Cambodian government granted a 30-year concession to operate the nation's railways to Toll (Cambodia) Co., Ltd., a joint venture between Australia's Toll Holding and Cambodia's Royal Group (48/52 ownership split). By late 2014, Toll Holding sold its entire 55% stake to Royal Group, making it the sole owner. The company was rebranded as Royal Railway Cambodia (now Plc.). As of now, Royal Railway Plc. remains wholly owned by the Royal Group, under the leadership of Kith Meng.

Cambodia Beverage Company-Commercial Office

Contributors:
Malen Chung
Independent Researcher
Architect

Sakona Loeung
Independent Researcher
Architect

State, Province, Region
Cambodia

Industrial classification
Food
Drink Processing



Figure 1: Stocks still available in the premises of the fist Pepsi factory in Battambang. © The Better Cambodia



Figure 2: The fist Pepsi factory in Battambang © The Better Cambodia



Figure 3: 1960's Pepsi-Cola Factory. Source: Chao Kampuchea. © Chao Kampuchea

Brief description
The original factory buildings have been converted to office space, while the front building was demolished after it was deemed to be beyond repair. It originally reflected Coca-Cola's 20th Century architectural brand identity and economic legacy, symbolising a 20th-century shift toward mass production, international trade and the cultural impact of consumer goods. At the time, it played a crucial role in the evolution of industry, labour, globalisation and social change in Cambodia.

Periods of operation
Originally opened by Pepsi Cola in 1960, the factory ceased operations in 1975. After the civil war, the Coca-Cola reopened the site in 1993, and it continues to operate today.

Protection and management
The site does not feature in any regional and national inventories, and does not have statutory protection

Ownership
Cambodia Beverage Company Limited, which is part of Coca Cola

Glass Factory, Stung Meanchey, Phnom Penh

Contributors:
Malen Chung
Independent Researcher
Architect

Sakona Loeung
Independent Researcher
Architect

State, Province, Region
Cambodia

Industrial classification
Paper
Glass
Packaging

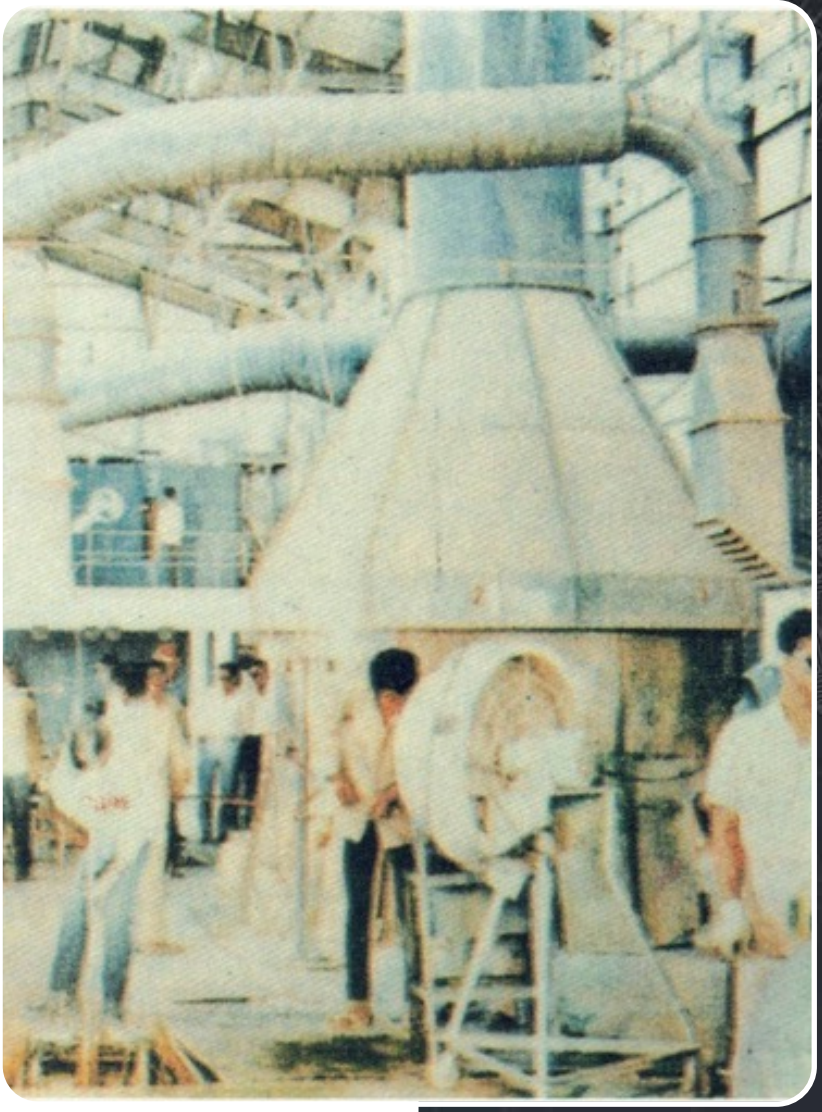


Figure 1: Interior view of glass factory showing activities during operation in 1960s. Source: *L'industrialisation du Cambodge, Photos-souvenirs du Cambodge Sangkum Reastr Niyum*. Courtesy of The Documentation Center of Cambodia (DC-Cam) Archive. © DC-Cam Archive

Site description
In the mid-1960s, as part of industrial development programmes during the Sangkum era under Prince Norodom Sihanouk, the Cambodian government built a modern glass production facility near Phnom Penh, in the Stung Meanchey area. This project was financed and supported by the People's Republic of China as part of broader foreign-aid industrial cooperation with Cambodia in the 1960s.

The factory represented an investment of approximately 130 million riels (about 13 million French francs) and formed part of a broader programme of state-led industrial development designed to strengthen Cambodia's manufacturing sector during the Sangkum period.

The glass factory construction was underway in the mid-1960s and planned to begin production by early 1967, with equipment and capital provided through this technical assistance programme. The Stung Meanchey facility was designed to be a state-owned glass production plant with an intended annual capacity of roughly 3,000 tonnes of glass output. Contemporary sources from the mid-1960s confirmed that the plant was planned to produce approximately 3,000 tonnes of glass annually.

It was intended to employ 250–300 workers when fully operational in 1967. These figures were reported in contemporary economic analyses of Cambodia's industrial development in the 1960s, highlighting the factory's role as one of the country's early modern manufacturing facilities.

The factory's products would have served domestic needs for glass, likely including flat glass for construction, bottles and containers, and possibly other industrial glass products essential for a developing economy with growing urban infrastructure. It was part of Cambodia's first wave of industrialisation, intended to diversify beyond agriculture into manufacturing and construction supplies. During the Sangkum period, the government promoted the development of domestic industries (particularly in construction materials and light manufacturing) in order to reduce dependence on imports and support urban and infrastructure development.

Period of operation
The grand opening of this factory was on 11th June 1968. Due to the internal war, the factory closed its operation from 1970 until the 1990s. Today, the factory still exists it is not in operation

Mid-1960s: Government planning & foreign aid assistance agreed for glass plant development

1966: Construction progressing or nearing completion, with production scheduled soon.

Early 1967 (planned): Factory was expected to begin operations with full workforce and capacity

1968: Grand opening

1970: Production shuts down because of during the civil war

Historical Sources

Phlek, C. (1966) *Grâce aux progrès rapides de l'industrie la structure économique du pays se modifie de plus en plus.* Le Monde Diplomatique (online). Available at https://www.monde-diplomatique.fr/1966/09/ (Accessed: 3rd March 2026)

Hays, J. (2008) Economic History of Cambodia. Facts and Details. Available at https://factsanddetails.com/southeast-asia/Cambodia/sub5_2d/entry-2923.html (Accessed: 3rd March 2026)

Protection and management

Some buildings still exist and appear to have been reused. These can be seen from outside the compound, but it is currently impossible to view inside the factory. This site is not registered in any inventory and has no statutory protection from local or national government. However, it remains an important relic from Cambodia's first wave of industrialisation.



Brunei Darussalam

National Industrial Narrative

Unfortunately, our project was unable to establish contact with industrial heritage specialists in Brunei Darussalam, so this summary is compiled without the detailed knowledge of national correspondents. The hope is that the creation of this report will help establish more formal contacts in the future and help properly explore the industrial heritage of the country.

Historic Overview

Prior to the colonial period, what is now Brunei Darussalam was the heart of the Sultanate of Brunei, a powerful maritime empire originating in the 14th century. At its peak in the 15th and 16th centuries, it controlled much of the coastal areas of Borneo and extended as far as the southern Philippines. It fought a brief war with the Spanish in 1578, but was never fully colonised by Spain.

Three centuries later, Brunei was itself finally colonised, becoming a British protectorate in 1888. Internal self-government was established in 1959, but full independence from the United Kingdom of Great Britain and Northern Ireland was only finally achieved in 1984. Inevitably, over a century of British colonial rule brought with it commerce and industry, together with mineral extraction and forest industries. Ultimately, it was energy, in the form of coal and then oil and gas, which grew to dominate the emerging economy.

However, as is the pattern across the Southeast Asia region, Brunei Darussalam was previously host to a rich variety of crafts and traditional industries in the pre-colonial era, and through the Sultanate's colonial activities was integrated into regional and international trading networks. This led to the development of a variety of industrial activities and trades, such as metal working (iron, brass, copper, and silver) and fine textile production. Other industries were centred on wood-crafting sites, which included boat construction, and forest-related products.

After the arrival of the British, initial efforts were concentrated on exploiting coal, but there were also significant timber industries and forest-based activities, not least rubber plantations, and the production of camphor and cutch. The establishment of the British Malayan Petroleum Company in 1922 proved to be a major milestone, and was followed by the discovery of oil in 1929 and the formation of a partnership with Royal Dutch Shell. The company eventually became Brunei Shell Petroleum in 1957, and in the same year, embarked upon the first offshore oil exploration.



Figure 1: Brunei Shell Petroleum's G Platform off the Seria Coast in 1958. Source: Wikimedia Commons.

Oil and Gas currently accounts for almost 50% of the country's GDP. Its resulting cultural significance is reflected in its petroleum-related industrial heritage, which includes the 'Billionth Barrel Monument', to be found in the Belait District and dating from 1991. The 'Seria Energy Lab', and education facility, can also be found nearby. More evidence of the importance of oil and gas can be experienced in the Brunei Energy Hub, which is situated in the former Royal Customs and Excise Building in a conservation project sponsored by Brunel Shell Petroleum.

Further afield, there are significant remains of the coal industry in Maura region. Coal had been extracted for local use for many years, but it was the discovery of potentially exploitable coal seams in 1844 that first provoked British interest in Brunei. It took another four decades for

commercial mining activity to commence at Serai Pimping, which later became Brooketon Colliery. Production ceased in 1924, but there are significant archaeological remains for Brunei's Museums Department to consider developing it into an open-air eco-tourism museum.

National Inventory of Built Heritage

Brunei Darussalam has a National Inventory of Heritage Sites, the continued development of which is in the care of the Museums Department of the Ministry of Culture, Youth and Sports. The expectation is that it will include industrial heritage, given the rich history of coal and oil extraction and other industries across the country.

System of Statutory National Protection

Brunei Darussalam's Antiquities and Treasure Trove Act (Chapter 31) provides the legal framework which establishes a process for declaring and scheduling ancient monuments and historical sites, based on the National Inventory of Heritage Sites, the authority being The Museums Department of the Ministry of Culture, Youth and Sports.



Figure 2: 'Nodding Donkey' oil well pump situated outside the Seria Energy Lab. Photograph by DeltaSquad833 (2021). Source: Wikimedia Commons

Some industrial heritage sites are protected and have been developed as museums and visitor attractions, including the Billionth Barrel Monument, the Brunei Energy Hub and the Labu historic rubber plantations sites. In addition, the potential for conserving and opening up the protected site of Brooketon Colliery in the Muara region is under consideration.



Lao People's Democratic Republic

Our project team was, unfortunately, not able to establish contact with industrial heritage specialists in Lao People's Democratic Republic, so this summary is compiled without the detailed on-the-ground knowledge of national correspondents. The ambition, therefore, is that the creation of this study will lead to the establishment of more formal contacts in the future and help properly explore the industrial heritage of Lao People's Democratic Republic.

Historic Overview

Pre-historic Laos is associated with Austroasiatic-speaking peoples who, archaeological evidence suggests, arrived over 45,000 years ago, and in Pre-modern times (c. 500 BCE to 800 CE), indigenous tribes are known to have developed bronze and iron production. Lao first emerged as the Kingdom of Lan Xang Hom Khao in 1353, with the help of the Khmer Empire. At its peak, Lan Xang was one of the largest kingdoms in South-East Asia, extending into what is now Thailand and Cambodia, and peaking during the reign of King Sourigna Vongsa (1637-1694).

Thereafter, Lao was subjected to a period of fragmentation and foreign domination, initially by Siam, and from 1893, by France. French colonial rule had already extended to Viet Nam and Cambodia, and lasted until independence in 1953. Starting out initially as a constitutional monarchy, Lao PDR was soon drawn into the Cold War, resulting in a civil war from 1959-1975 during which foreign actors (North Viet Nam, the USSR, and the USA) fought to take control. The conflict ended when Pathet Lao deposed the monarchy and established Lao People's Democratic Republic (Lao PDR) in 1975, aligning with the now-unified neighbouring Viet Nam.

Subsequent economic reforms in the 1980s have since led to economic and industrial growth, resulting in Lao PDR joining ASEAN in 1997 and the World Trade Organisation in 2013. One striking feature of modern Lao is the enormity of the hydro-power schemes that have been built or which are planned or under construction. This explains why it is sometimes referred to as the 'battery of ASEAN'.

National Industrial Narrative

There is evidence of ancient and indigenous industries, notably metallurgy (bronze and iron), and extensive trade networks. For example, on the Xieng Khouang Plateau, the Iron Age 'Plain of Jars' archaeological site dates from 500BCE to 800CE suggests the manufacture and export of iron tools. In 2019, this megalithic archaeological landscape was inscribed onto the World Heritage List as *Megalithic Jar Sites in Xiengkhuang* – Plain of Jars. In addition, early tin metallurgy, possibly a continuation of indigenous techniques, was still being practiced along the Mekong River as late as the last century.

However, the first modern industrial-scale metallurgy commenced during the French colonial era's tin mining, notably in the Nam Phathaen Valley. Mining has continued since independence, building on the surviving colonial infrastructure. This was initially supported by some railways, including the first railway, Don Det–Don Khon narrow-gauge railway, which was opened by the French in 1893 (see Figure 1). The French also developed cash crops, with industries developing around rice, coffee, sugar cane and rubber in particular.



Figure 1: The remains of a steam locomotive at Si Phan Don, Champassak (on the Mekong River) which ran on the Don Det–Don Khon narrow-gauge railway, Lao's first railway, opened by the French in 1893. Photograph by Don Khon (2017). Source: Wikimedia Commons

Meanwhile, small water power installations had existed for many centuries, not least for irrigation systems. However, unlike its other colonies in the region, the France does not appear to have built a substantial hydro power station in Lao DPR. So it is remarkable that hydropower is now one of the mainstays of the Lao economy. The Nam Ngum Dam was one of the first major projects, commencing in 1968 and completed in 1971, and several huge projects have come on line since then (see Figure 2).

Lao People's Democratic Republic is home to four UNESCO World Heritage properties, one being *Town of Luang Prabang*, which contains many buildings constructed in the French style with links to colonial commerce and industry. Similarly, the French left a rich architectural legacy in Lao DPR's capital city, Vientiane.



Figure 2: 'The Nam Ngum Dam and hydropower scheme (number 1), opened in 1971. Photograph by Chaoborus (2011). Source: Wikimedia Commons

National Inventory for Cultural Heritage

The Heritage Department under the Ministry of Information, Culture and Tourism (MICT) of Lao PDR has a national inventory of heritage sites, but it is currently quite brief. Heritage, including World Heritage, is under the purview of the National Heritage Committee. Ancient industrial heritage is recognised within these initiatives, but historic and modern industrial heritage remain to be formally identified and protected.

System of Statutory National Protection

Lao PDR has statutory protection for its heritage sites, primarily under the revised 2021 Law on National Heritage. This law covers all cultural, historic and natural heritage sites, so any industrial heritage would be included within this scope.



Timor-Leste

It was, unfortunately, not possible to establish contact with industrial heritage specialists in Timor-Leste, so this summary is compiled without the detailed knowledge of national correspondents on the ground. The hope is therefore that the creation of this report will lead to the establishment of more formal contacts in the future and help properly explore the industrial heritage of Timor-Leste.

Historic Overview

Prior to colonisation, archaeological evidence suggests the earliest human settlement dates from over 40,000 years ago. There followed sequences of migration by different ethnic groups. By the 13th century, Timor was integrated into regional trade networks as far as China and India, trading goods derived from its abundant forests, like sandalwood.

Colonisation by Portugal commenced with the arrival of traders in the 16th century, and was formally established by the 18th century, despite competition from neighbouring Dutch colonists. In addition to sandalwood, coffee became a key commodity (see Figure 1). Investment by the Portuguese authorities was, however, small compared with that of other European powers. The colonial administration was, despite Portugal's neutrality, interrupted by Japanese occupation during World War II, which resulted in significant loss of life and destruction. As was the case elsewhere in South-East Asia, colonial rule was restored after the end of the war in 1945.



Figure 1: Coffee production in the Portuguese colonial era, c. 1900. Source: Colecção Jill Rosemary Dias - Wiki Media Commons

A year after Portugal's 'Carnation Revolution' in 1974, Timor-Leste declared independence but was first invaded and then annexed by Indonesia in 1976. There followed more than two decades of brutal occupation during which there was widespread violence and destruction, with over 100,000 people estimated to have been killed. This finally came to an end after a referendum in 1999 and the restoration of independence on 20th May 2002.

Inevitably, the first years of independence brought severe challenges, including political instability and difficult economic conditions, and in 2006, the UN sent in forces to keep the peace. However, since 2012, Timor-Leste has experienced relative calm, with the staging of elections. This has enabled it to properly engage with the international community, and in 2025, it joined ASEAN.

Against this background, it is unclear if any significant industrial heritage has survived its various stages of hiatus and upheaval. Much of its industries are based around agriculture and forestry. There are likely to be the vestiges of colonial-era coffee and sandalwood production as well as traditional hand-woven tai textiles (see Figure 2), ceramics and other craft industries, as well as fish and food processing based on cash crops. There does not seem to have been a legacy of heavier industry, but more recently, there has been oil and gas exploration and production.



Figure 2: Tai cloth being woven on a hand-loom, 2010. Source: Australia Timor-Leste Friendship Network - Wikimedia Commons

National Inventory of Cultural Heritage

Timor-Leste does not yet have a comprehensive, publicly available national inventory of historic sites, but efforts are underway to create one. This is being done with the assistance of UNESCO, who are supporting the establishment of the Timor Leste National Archives (Figure 3).

System of Statutory National Protection

No formal system of statutory protection has yet been established across Timor-Leste, but legal protection is in place for some historic sites.



Figure 3: Coffee production in the Portuguese colonial era, c. 1900. Source: Colecção Jill Rosemary Dias - Wiki Media Commons

6

Conclusions
Looking Forward

Conclusion

Gabriel Caballero,
Giacomo Martinis
and Miles Oglethorpe

This report is the result of an extraordinary collective effort of practitioners and scholars who have a common interest in safeguarding South-East Asian industrial heritage. We extend our deepest gratitude to all contributors who have participated in this initiative, and in some cases under challenging professional and overarching contextual circumstances. The breadth and diversity of material they have helped gather for this report reflects not only scholarly commitment, but also a shared recognition of the importance of advancing the discourse on industrial heritage across the region. We hope this report will eventually ripple beyond the region to enrich knowledge and awareness of industrial heritage across the world. Contributors have worked across different institutional contexts, with varying levels of access and degrees of available data, and yet have collectively produced a body of work that begins to articulate a regional narrative. What has emerged is both inspiring and instructive: a baseline regional snapshot that reveals patterns, gaps, and opportunities, and that demonstrates the potential of collaborative knowledge accumulation in a field that has, until recently, remained fragmented, underappreciated and mostly unknown.

At the same time, this work must be understood as being a beginning rather than a conclusion. The process of compiling this study has been energising, opening new lines of inquiry and collaboration within the region, and sowing the seeds of new networks. However, it also underscores the inherent incompleteness and unevenness of current datasets. The disparities in contributions, whether in terms of depth, scope, or methodological approach, reflect broader structural realities across the region, including differences in institutional capacity, availability of disciplinary researchers, national priorities, and levels of awareness regarding industrial heritage. The absence of three of eleven South-East Asian countries from this initial effort further highlights the need for a more inclusive and sustained engagement moving forward. Yet, rather than diminishing the value of this publication, these limitations reinforce its importance: it provides an invaluable starting point, having created baseline data upon which a more comprehensive, balanced, and methodologically consistent body of knowledge can be built.

A New Chapter Begins to Dig Deeper

Looking ahead, the priorities are both clear and urgent. There is a need to systematically fill the gaps identified in this study. This involves not only encouraging participation from countries that were not able to contribute in this first phase, but also supporting those whose contributions require further development. Capacity-building will be central to this effort. Targeted seminars, technical workshops and focused research agendas in academic institutions can help build expertise in documentation, evaluation, and conservation of industrial heritage. In this regard, the potential for wider consultations, such as a hybrid regional conference that brings together practitioners, researchers, policymakers, and community stakeholders, represents a critical next step. Such a platform could benefit from using this report as a foundational document, scaling up its efforts in fostering dialogue, refining methodologies, and establishing a shared agenda for the region in what concerns industrial heritage. This is an initiative that TICCIH or ISC20C would be well placed to take forward in the future.

In the future, a key area requiring systematic development lies in the integration of geospatial analysis and digital tools. The current study has demonstrated the richness of the material, but also the difficulty pinpointing its spatial distribution and visualising it. From a research standpoint, introducing mapping and geospatial datasets would allow for a clearer understanding of patterns of industrialisation, connectivity, and regional variation. To push further the importance of mapping, a historical layer reflecting the typology and movement of industry during early globalisation, colonisation and the decolonisation process can depict a bigger narrative of interdependence of the region to historical trades and production. This will also hopefully provide a greater appreciation of the intricate interdependence of global trade that we see today.

This, in turn, could inform comparative research, policy development, and heritage management strategies, including verification of protected area boundaries, extension of protection measures for these sites, and assessment of risks and pressures. The creation of a regional industrial heritage database, structured around consistent data standards and interoperable formats, would be a logical extension of this work. Such a database would not only facilitate research, inventorying, and protection efforts at the national level, but would also enable cross-border analysis and collaboration, particularly in identifying shared typologies and transnational industrial networks as well as in disseminating good and transferable practices across the region.

Equally important is the need to strengthen the integration of industrial heritage into national and international heritage systems and legal mechanisms of protection. In many South-East Asian countries, industrial heritage remains underrepresented in official inventories and protection frameworks, which have traditionally prioritised archaeological, historical, religious, or monumental sites. It also usually does not feature in heritage glossaries, thesauri and site classification systems.

This report therefore highlights the urgency of addressing this imbalance. Encouraging the inclusion of industrial heritage within national registers, legal protection mechanisms, and conservation policies is essential if these sites are to be safeguarded for future generations. This effort must also be accompanied by advocacy and awareness-raising, ensuring that policymakers, practitioners, and the public recognise the value of industrial heritage not only as historical evidence, but as a resource for education, community identity, and sustainable development.

People at the Heart of Industrial Heritage

This study began with UNESCO's aim of filling a thematic regional gap in the World Heritage List. However, the report highlights the understanding that industrial heritage manifests itself as being both tangible and intangible. Almost a third of the featured places and practices documented here are inseparable from the knowledge systems, skills, and cultural traditions that sustain them. Whether in the form of artisanal techniques, agricultural practices, or industrial know-how, these intangible dimensions are critical to the significance of industrial heritage in South-East Asia.

Many of the trades reported in this study are also vanishing with the further rapid changes in industry and machine learning. Some trades may ultimately vanish if they become overlooked and obsolete. Future work should therefore seek to deepen the exploration of these relationships, drawing on interdisciplinary approaches that bridge heritage studies, anthropology, and

the history of technology. This also opens opportunities to engage with multiple international frameworks, including those related to intangible cultural heritage and documentary heritage, thereby expanding the scope of recognition beyond the conventional parameters of World Heritage.

Adaptive reuse emerges from this study as a particularly important strategy for conservation. In contexts where rapid urbanisation and economic development place pressure on historic industrial sites, adaptive reuse offers a pragmatic means of preserving heritage while accommodating contemporary needs and saving the embodied energy already invested in existing buildings and structures. Examples from across the region, particularly in Malaysia and Singapore, demonstrate how industrial buildings can be transformed into cultural, commercial, or educational spaces, retaining their historical character while generating new forms of public value and promoting sustainable regeneration. These cases also illustrate a broader point of heritage discourse, where significance is not solely derived from historical or architectural merit, but also from the ways in which heritage can contribute to present-day social, cultural, and economic life. This perspective aligns with emerging approaches that emphasise public value and community engagement as central to heritage places and their sustainability.

At a regional level, there is significant potential to identify and promote exemplar sites that can serve as ambassadors for South-East Asian industrial heritage. These sites, selected for their representativeness, integrity, and interpretive potential, could play a key role in raising awareness and building support for industrial heritage across the region. They may also form the basis for future nominations to international recognition frameworks, including but not limited to the World Heritage Convention. Importantly, this study encourages a broader view of such nominations, considering not only individual sites but also cultural landscapes, transnational properties, and thematic groupings that reflect the interconnected nature of industrial development in South-East Asia.

At the same time, the study brings into focus a range of common challenges that must be addressed collectively. These include the need to identify conservation priorities in contexts of limited resources, to address shared threats such as urban development, environmental degradation and neglect, and to navigate complex political environments that may either support or hinder heritage initiatives. The digitisation of analogue records emerges as a particularly pressing concern. Without concerted efforts to digitise and make these materials accessible, there is a risk that critical knowledge will be lost.

Importantly, this report also begins to establish a quantitative baseline for industrial heritage in South-East Asia. The documentation of contributions from multiple countries, the detailed identification of 70 sites and practices, and the compilation of almost 700 sites in the broader long list of potential heritage assets represent a significant step forward. These figures, while preliminary, provide a sense of scale and underscore the vast scope of what remains to be explored. They also highlight the importance of developing more systematic approaches to data collection and analysis, ensuring that future work can build on a solid empirical foundation that is responsive to the distinctive regional features of this heritage category as it surfaced from this study.

Finally, we recognise that this study has only begun to engage with several areas that warrant deeper investigation. Pre-modern industrial systems, while present in the current work, offer significant opportunities for further research, particularly in understanding long-term technological continuities and indigenous knowledge systems. Similarly, translational approaches linking research, data management, mapping, and policy remain underdeveloped but hold considerable potential for advancing both scholarship and practice.

Thank you

In closing, this publication represents both an achievement and an invitation. It is an achievement in bringing together a diverse and committed network of contributors, and in establishing a foundational body of knowledge on industrial heritage in South-East Asia. At the same time, it is an invitation to continue this work, to expand, refine, and deepen our understanding of the region's industrial past, and to ensure its relevance for the future. The task ahead is substantial, requiring sustained collaboration, innovation, and commitment. Yet the opportunity is equally significant: to shape a more inclusive, nuanced, and globally relevant narrative of industrial heritage, one that reflects the unique histories, landscapes, and communities of South-East Asia, and that contributes meaningfully to broader conversations on heritage, development, and identity.

*Terima kasih, maraming salamat po, cam on, khop khun khrap, jeesuu ba, xie xie n*i to everyone involved.

ANNEX 1

Long Lists of Industrial Heritage Sites

ANNEX 1: Long List of Industrial Heritage in the Region

This section compiles available data on industrial sites and practices of potential heritage value across South-East Asia and consolidates these long lists into a single inventory. Its purpose is to become a first repository of candidate sites and places of intangible heritage practices, thus serving as a basis for potential legal protection, conservation planning, and national/regional discussion, and to guide and stimulate future research and verification efforts. Contributors have recorded each heritage place's name, location, industrial typology, period or founding date, and other details in eight of eleven South-East Asian countries. However, entries are uneven: some countries have extensive lists, while others have only a few or none. This variability highlights both gaps in the information available and a need for systematic review in the future.

Recurrent fields include 'Site Name', 'Location', 'Year or Period of Establishment', and 'Industry Typology'. Some contributors have also provided data on current 'State of Conservation', 'Ownership/Management', 'Legal Status/Protection', 'Cultural or Historical Significance', and 'Known Threats', though these are not consistent in the country registry. For example, some entries list exact founding years and threat levels, while others give only approximate dates or no commentary. Equally, the presence of free-text "contributor notes" and source references varies widely. In short, the core identification fields are broadly consistent, but contextual fields (Condition, Significance, etc.) appear to be more challenging to compile consistently. Moreover, as it has been the case for the entries received for the 10 sites, although the initial focus of this study was tangible heritage, several industrial practices have been signalled by the contributors.

Full awareness of details of each site clearly varies by country and by site. For instance, the Philippines list contains dozens of sites accompanied by detailed notes, whereas Cambodia's list is very concise and Timor-Leste does not have its own list. This uneven coverage implies varied levels of research and consciousness of the industrial heritage information in each country, which is no surprise. For the Philippines, its national inventory started to be built even before this investigation, with reports submitted to the TICCIH Congress in 2022. Prior to that, it already established its TICCIH Philippine National Committee in November 2021, making it an exemplar to consciousness and understanding of industrial heritage in the region. Other countries have not yet reached this level of organisation and consciousness for identifying and safeguarding industrial heritage at the national level. The gaps also signify that some important sites in the region could be overlooked and this serves as a starting point for future action. Notably, this may include verification of data and filling gaps to raise general awareness, support the formulation of related legislation and allow for the conservation of these important heritage sites and practices.

Indonesia

N°	Name of the property	Location	Year of establishment	Typology of industry
1	The Ombilin Coal Mining Heritage of Sawahlunto	"Sawahlunto, West Sumatra"	1892	Mining - coal
2	Lebok Tandai Gold Mine	"North Bengkulu, Indonesia"	1937	Mining - gold
3	Cikotok Gold Mine	Banten	1936	Mining
4	Rancabali Tea Factory	Ciwidey, West Java	1870	Food processing - tea
5	Tambi Tea Factory	Wonosobo, Central Java	1885	Food processing - tea
6	Malabar Tea Factory	Lumajang, East Java	1894	Food processing - tea
7	Kertowono Tea Factory	"Bandung Regency, West Java"	1910	Food processing - tea
8	Kayu Aro Tea Plantation Factory	Kerinci, Jambi	1923	Agriculture - Tea
9	Banaran Coffee Factory	Semarang Regency, Central Java	1911	Food processing - coffee
10	"Karanganyar Coffee Factory"	Blitar, East Java	1874	Food processing - coffee
11	Jollong Coffee Factory	Pati, Central Java	1895	Food processing - coffee
12	"Dillem Wilis Coffee Factory"	Trenggalek, East Java	1929	Food processing - coffee
13	Kretek Industry	Kudus, Central Java	1937	Tobacco
14	"Wismilak Cigarette Factory"	Surabaya, East Java	1920	Tobacco
15	"Rumah Atsiri Essential Oil Refinery"	Tawangmangu, Central Java	1963	Essential Oils
16	Salt Warehouse	Kalianget, Sumenep, Madura	1899	Salt
17	"The Camphor Trade Legacy"	Barus, North Sumatra	"Since the 2nd century CE"	Forest Industries - Camphor
18	Colomadu Sugar Factory	Karanganyar, Central Java	1861	Food processing - sugar
19	"Gondang Baru Sugar Factory"	Klaten, Central Java	1860	Food processing - sugar
20	Cepiring Sugar Factory	Kendal, Central Java	1835	Food processing - sugar
21	Djatiroto Sugar Factory	"Lumajang, Central Java"	1910	Food processing - sugar
22	Pangkah Sugar Factory	Tegal, Central Java	1832	Food processing - sugar
23	Sragi Sugar Factory	Pekalongan, Central Java	1836	Food processing - sugar
24	Kanigoro Sugar Factory	Madiun, East Java	1894	Food processing - sugar
25	Kampung Batik Laweyan	Surakarta, Central Java	16th century	Craft - textiles
26	Kampung Batik Kauman	Yogyakarta	18170	Craft - textiles
27	"Kampung Batik Pekalongan"	Pekalongan, Central Java	1850	Craft - textiles
28	Kampung Batik Lasem	Rembang, Central Java	19th century	Craft - textiles
29	Kampung Batik Cirebon	Cirebon, West Java	19th century	Craft - textiles
30	Minangkabau Songket Weaving	Pandai Sikek, West Sumatera	19th century	Craft - textiles
31	Minangkabau Songket Weaving	"Silungkang, West Sumatra"	19th century	Craft - textiles
32	Minangkabau Silversmiths	Koto Gadang, Agam, West Sumatera	19th century	Craft - metals

33	Pindad Weapon Factory	Bandung, West Java	1808	Armaments
34	NV Braat Machine Factory	Surabaya, East Java	1901	Engineering
35	VOC Dock	"Makassar, South Sulawesi"	"17th - early 10th century"	Shipbuilding
36	Tanjung Priok Port Sation	Jakarta	1885	Shipbuilding
37	Sunda Kelapa Port Sation	Jakarta	12th century	Shipbuilding
38	Tanjung Perak Port Sation	Surabaya, East Java	20th century	Shipbuilding
39	Cement Factory	"Indarung, Padang, West Sumatera"	1910	Cement
40	Ancol Stream Power Plant	Ancol, Jakarta	1910	Infrastructure - electricity
41	Cinchona Factory	Bandung, West Java	1890	Medicine
42	Landskoepok Inricting en Instituut Pasteur (Parc Vaccinogene 1890)	Bandung, West Java	1923	Medicine

Malaysia

N°	Name of the property	Location	Year of establishment	Typology of industry
1	Iron Smelting Industry	Sungai Batu, Bujang Valley, Kedah	6th century BC	Metallurgy - iron
2	Sungai Lembing Tin Mines and town	Pahang	1886 – 1987	Mining - tin
3	Tanjung Tualang Sri Banting Tin Dredge n°5 (TT5) Sri Banting Tin Dredge	Batu Gaja, Perak Dengkil, Selangor	1938 1974	Mining - tin (dredging)
4	Royal Selangor Pewter Showroom/ Factory	Kuala Lumpur	1885	Craft - metals
5	1st rubber tree in Malaysia	Kuala Kangsar, Perak	1877	Forest Industries - Rubber
6	Rubber Smokehouse	Lunas, Kedah	1961	Forest Industries - Rubber
7	Rubber Research Institute of Malaysia	Kuala Lumpur	1935	Forest Industries - Rubber
8	Traditional Boat Making	Pulau Duyung, Terengganu	19th Century	Shipbuilding
9	Labu Sayong Ceramics Industry	Sayong, Perak	c1810	Ceramics
10	Traditional Woven Fabrics	Kelantan, Terengganu & Pahang	16th Century	Crafts -Textile
11	Charcoal Factories	Kuala Sepetang, Perak	20th century	Forest Industries - charcoal

Myanmar

N°	Name of the property	Location	Year of establishment	Typology of industry	State of Conservation
1	Textile Factory at Thamine	"Mayangone Township, Yangon"	ca 1966–67	Textiles	"Factory appears to be an operational textile mill (not a formally conserved heritage site). Indicating the site's continuing industrial/commercial use rather than a heritage-protected function."
2	Boats dockyard at Dala	Dala Township, Yangon Region	ca 1875	Shipbuilding - Boats	"Inland Water Transport (IWT) is a state-owned enterprise under the Ministry of Transport and Communications that operates river transport services and manages related infrastructure. In Yangon, its responsibility includes the management of dockyards and maintenance facilities on the Ayeyarwady, Chindwin, and Yangon river systems."
3	"Railways shunting yard in Ma-hlwa-gon Township"	Ma-hlwa-gon Township	Colonial era under British rule, 1920s-30s?	Infrastructure - Railways	"The yard continues to function today as part of Myanma Railways, though capacity and maintenance have been affected by underinvestment. Recent modernization programmes (with international aid, e.g., JICA projects) have mentioned Mahlwagon yard upgrades as part of Yangon rail improvements."
4	Oil Refinery at Thanlyin	Thanlyin	1908	Petroleum	"Mid-1950s (1955–1957) — most modern summaries say the Thanlyin refinery was rebuilt/constructed after WWII in the 1950s "
5	Railway works at Insein	Insein	"The original colonial-era railway workshops at Insein (the marshalling/repair works that served Rangoon/Yangon): they were already in existence by 1877 (the opening year of the Yangon–Pyay line) "	Infrastructure - Railways	"Adjacent workshops & heavy maintenance _ The Insein Locomotive and Carriage Works (large machine/erecting shops) are sited at Insein and carry out heavy repair and overhaul work for Myanmar Railways. This workshop complex is a significant industrial element affecting the site's conservation context (vibration, emissions, heavy use)."
6	"Diamond Soft Drinks Factory on U Wisara Road"	South Oakkalarpa Township	"1926 April 1996 says that the "70-year-old Diamond soft drink factory""""	Food Processing - Drinks	
7	"City Water Supply Works at Gyobyu"	64 kilometres (40 miles) north of Yangon	1940	Infrastructure - Water	" Yangon City Development Committee (YCDC) "

8	The Twante Canal	16.723889, 95.965	1903	Infrastructure - Canal	"Due to the lack of regular maintenance of the canal, silt has accumulated and the waterway has become narrower over the past few years. As a result of erosion, the canal had widened to about 600 feet (180 meters) by 2010. Despite this deterioration, there are still no plans to construct concrete embankments to repair and maintain the canal, and there are also issues related to the waterway navigation system. Today, the Twante Canal remains an essential waterway, though it faces challenges such as silting and narrowing due to insufficient maintenance. Efforts have been made to address these issues, including widening the canal's mouth in 2010"
9	Bridge across Nga-moe-yeik Creek	"Connection between South Okkalapa and Dagon Myothit (North) townships"	19.March,1999	Infrastructure - Roads	"In recent years, the bridge and its surrounding areas have undergone various developments. For instance, in 2016, a new Nga Moe Yeik Bridge was constructed to enhance transportation convenience. The bridge, which spans 110 feet in length and 18 feet in width, was built as part of the Yangon Region Government's 2018-19 fiscal year budget. "
10	Yangon (Mingalardon) Airport	"Mingaladon Township approximately 15 kilometers north of downtown Yangon"	1947	Infrastructure - Aviation	"In 2007, a significant modernization project was completed, which included the construction of a new terminal and the extension of the runway to accommodate larger aircraft. This expansion enhanced the airport's capacity and services, aligning it with international standards"
11	Lanmadaw / Nanthida Jetty	Yangon		Infrastructure - Water Transport	
12	Boat Dockyard at Botataung Pagoda	Strand Road, Yangon	5th century BC, rebuilt 1954?	Shipbuilding	
13	49th Street – Air Blower Factory			Engineering	
14	Sule (Strategy First, AA Pharmacy)	Kyauktada Township, Yangon		Pharmaceutical	
15	"Warehouse at Sat-Hsan (Industrial Warehouse)"	Downtown Yangon		Commercial	Unprotected
15	"Warehouse at Sat-Hsan (Industrial Warehouse)"	Downtown Yangon		Commercial	Unprotected
16	Myitnge Carriage and Wagon Factory	Amarapura Township, Mandalay Region	1905	Engineering - Railways	
17	Ywathitgyi Locomotive Workshop	Pwintbyu Township, Magway Region		Engineering - Railways	
18	Namtu Bawdwin Mines	Namtu Township, Shan State	15th Century, then 19th Century colonial	Mining - lead-zinc-silver-copper-nickel	Partial

Philippines

N°	Name of the property	Location	Year of establishment	Typology of industry	State of Conservation	Legal Protection
Infrastructure - Aviation						
1	Nielson Tower	Makati City, Metro Manila	1934	Infrastructure-Aviation	In current use as a restaurant (adaptive re-use	Marked structure; Registered Property, City of Makati
2	Ninoy Aquino International Airport Terminal 1	Parañaque City, Metro Manila	1981	Infrastructure-Aviation	In active use	Work of National Artist for Architecture Leandro V. Locsin; Registered Property
3	Old Davao International Airport Terminal Building	Davao City, Davao	1980	Infrastructure-Aviation	Disused	Work of National Artist for Architecture Leandro V. Locsin; Registered Property
Infrastructure - Roads						
4	Ayala Bridge	City of Manila, Metro Manila	1908; 1930-	Infrastructure-roads	In active use	Important Cultural Property, National Museum; Registered Property, City of Manila
5	Ayusan-Paoa Bridge	Vigan, Ilocos Sur	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum
6	Barit Bridge	Iriga City, Camarines Sur	1914	Infrastructure-roads	In active use	Important Cultural Property, National Museum
7	Bridge of Isabel II	Imus, Cavite	1857	Infrastructure-roads	In active use	Historical Marker, NHCP; Registered Property, City of Imus, Cavite
8	Bridge of Paoay (Lumang Tulay)	Paoay, Ilocos Norte	1800s	Infrastructure-roads	In active use	On the road southward to Currimao, it is an intrinsic part of the declaration of National Cultural Treasure pertaining to the San Agustin Parish Church Complex. Declared a National Cultural Treasure by virtue of National Museum Declaration No. 34-2020.
9	Britanico Bridge	Miag-ao, Iloilo	1873	Infrastructure-roads	degrubbing, repointing, and consolidation in 2016	Over 50 years old; Presumed Important Cultural Property, RA 10066

10	Dampol Bridge; Old Abanatan Bridge	Dupax del Sur, Nueva Vizcaya	1818	Infrastructure-roads	In active use as a pedestrian and light vehicle bridge	National Cultural Treasure, National Museum (by virtue of Museum Declaration No. 9-2015; Cultural Treasure of the Province of Nueva Vizcaya (Resolution No. 2019-3156; Registered Property, Province of Nueva Vizcaya
11	Puente de Alitao	Tayabas, Quezon	1793	Infrastructure-roads	In active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
12	Puente de Belen	Romblon, Romblon	1860s	Infrastructure-roads	In active use	Important Cultural Property, National Museum (under Historic Bridges of Romblon
13	Puente de Gibanga	Tayabas; Sariaya, Quezon	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum (under Tayabas Historic Bridges; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
14	Puente de la Ese	Tayabas, Quezon	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
15	Puente de la Paz	Romblon, Romblon	1934	Infrastructure-roads	In active use	Important Cultural Property, National Museum (under Historic Bridges of Romblon
16	Puente de la Princesa	Tayabas, Quezon	1800s	Infrastructure-roads	Ruins	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
17	Puente de Lakawan	Tayabas, Quezon	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
18	Puente de las Despedidas	Tayabas, Quezon	1800s	Infrastructure-roads	Built over with concrete span; segment of Spanish-era bridge underneath; in active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon

19	Puente de Malogonlong	Tayabas, Quezon	1850	Infrastructure-roads	In active use as a pedesrian bridge	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
20	Puente de Mate	Tayabas, Quezon	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
21	Puente de Reina Isabel II	Tayabas, Quezon	1852	Infrastructure-roads	In active use as a pedestrian and light vehicle bridge	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
22	Puente de Rio Casalogan	Romblon, Romblon	1860s	Infrastructure-roads	In active use	Important Cultural Property, National Museum (under Historic Bridges of Romblon
23	Puente de Romblon	Romblon, Romblon	1860s	Infrastructure-roads	In active use	Important Cultural Property, National Museum (under Historic Bridges of Romblon
24	Puente de San Francisco de Asis	Tayabas, Quezon	1854	Infrastructure-roads	Built over with concrete and steel span; segment of Spanish-era bridge underneath; in active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
25	Puente de Tumuloy	Tayabas, Quezon	1800s	Infrastructure-roads	In active use as a pedestrian and light vehicle bridge	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Historical Stone Bridges of Tayabas; Registered Property, City of Tayabas, Quezon
26	Puente Progreso	Romblon, Romblon	1925	Infrastructure-roads	In active use	Important Cultural Property, National Museum (under Historic Bridges of Romblon
27	Quezon Bridge	City of Manila, Metro Manila	1939	Infrastructure-roads	In active use	Important Cultural Property, National Museum; Registered Property, City of Manila
28	San Juan River Bridge; San Juan del Monte Bridge	San Juan City, Metro Manila	1899	Infrastructure-roads	In active use	Marked Structure, NHCP; Registered Property, City of San Juan
29	Santa Maria Bridge	Dupax del Sur, Nueva Vizcaya	1800s	Infrastructure-roads	Unknown	Important Cultural Property, National Museum

30	Santa Maria Bridge	Santa Maria, Ilocos Sur	1800s	Infrastructure-roads	In active use	National Cultural Treasure, National Museum, as part of the declaration for Nuestra Senora de la Asuncion Parish Church Complex
31	Spanish Bridge	Mahatao, Batanes	1800s	Infrastructure-roads	In active use as a pedestrian bridge	Local Cultural Property - Important Historical and Cultural Possessions, Municipality of Mahatao, Batanes (per Ordinance No. 20-17, series of 2020; Registered Property, Municipality of Mahatao, Batanes
32	Spanish Bridge	Sampaloc, Quezon	1888	Infrastructure-roads	In active use as a pedestrian bridge	Important Cultural Property, National Museum
33	Spanish Colonial-Era Bridge (Tulay na Arko)	Lucban, Quezon	1851	Infrastructure-roads	In active use	Important Cultural Property, National Museum
34	Taytay Boni (Boni Bridge)	Miag-ao, Iloilo	1854	Infrastructure-roads	Disused; conserved as part of Church complex	Part of the Miag-ao Church complex under the Baroque Churches of the Philippines UNESCO World Heritage Site; National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property, Municipality of Miagao (per Municipal Resolution No. 2012-051; Executive Order 2012-28; Registered Property, Municipality of Miagao
35	US-Philippine Island Friendship Bridge; Pasonglao Bridge	Tabuk City, Kalinga	1955	Infrastructure-roads	In active use	Registered Property, Province of Kalinga; Registered Property, City of Tabuk, Kalinga
Industrial Communities - Religious						
36	Mojon Chapel	Bais, Negros Oriental	1918	Industrial Communities-Religious	In active use	Over 50 years old; Presumed Important Cultural Property, RA 10066
37	Saint Joseph the Worker Chapel (Angry Christ Church)	Victorias, Negros Occidental	1950	Industrial Communities-Religious	In active use, limited private access	Important Cultural Property, National Museum
38	San Sebastian Basilica	City of Manila, Metro Manila	1891	Industrial Communities-Religious	In active use	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Marked Structure, NHCP
Infrastructure - Water Supply						
39	Buhisan Dam/ Osmeña Waterworks	Cebu City, Cebu	1912	Infrastructure-Water Supply	In active use	Registered Property, Cebu City, Cebu
40	Bustos Dam	Bustos, Bulacan	1926	Infrastructure-Water Supply	In active use	Registered Property, Province of Bulacan

41	Caliraya Dam	Lumban, Laguna	1939	Infrastructure-Electricity	In active use	Over 50 years old; Presumed Important Cultural Property, RA 10066
42	Ipo Dam	Norzagaray, Bulacan	1938	Infrastructure-Water Supply	In active use	Over 50 years old; Presumed Important Cultural Property, RA 10066; Marked Structure-Labanan sa Ipo Dam, NHCP; Registered Property, Province of Bulacan
43	La Mesa Dam and Reservoir	Quezon City, Metro Manila	1929	Infrastructure-Water Supply	In active use	Over 50 years old; Presumed Important Cultural Property, RA 10066
44	Prenza Dam	Marilao, Bulacan	1775	Infrastructure-Water Supply	Disused; abandoned	Over 50 years old; Presumed Important Cultural Property, RA 10066
45	The Wawa Dam Complex over Marikina River and its Intrinsic Setting in the Surrounding Area of the Montalban Gorge	Rodriguez, Rizal	1909	Infrastructure-Water Supply	Decommissioned, now protected as part of the Pamintinan Protected Landscape	Important Cultural Property, National Museum
Food Processing						
46	BPI Money Museum	Cebu City, Cebu	1924	Administrative, Legal, Commercial- Coinage and Banking	Adaptive re-use as the BPI Museum Cebu	Local Cultural Property - City Cultural Property, Cebu City
47	Coca Cola Bottling Plant	City of Manila, Metro Manila	1948	Food Processing-drink (bottling)	Partially demolished, remainedder adaptively-reused as commercial space	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
48	Gotiaco Building	Cebu City, Cebu	1914	Commercial-Hardware and Retail	Disused, in need of conservation	Local Cultural Property - City Cultural Property, Cebu City
49	Lim Bonfing Warehouse	Cebu City, Cebu	1932	Commercial - Bonded Warehouse	Disused, in need of conservation	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
50	Port Area Warehouses	City of Manila, Metro Manila	early 20th century	Commercial - Bonded Warehouse	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
51	Ricoa Chocolate Factory (Commonwealth Foods)	Mandaluyong City, Metro Manila	1956	Food Processing- Chocolate	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
52	San Miguel Brewery	Mandaue, Cebu	1940	Food Processing- Brewing	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
53	San Miguel Yamamura Packaging Corporation	City of Manila, Metro Manila	1938	Paper, Glass, and Packaging	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

54	San Miguel Polo Brewery (BBB)	Valenzuela City, Metro Manila	1937	Food Processing- Brewing	In active use	Local Cultural Property - City Cultural Property, Valenzuela City Ordinance No. 476, series of 2018
55	Yap Anton Warehouse	Cebu City, Cebu	1929	Commercial - Bonded Warehouse	Disused, in need of conservation	By virtue of Resolution No. 14-1163-2019, Important Cultural Property of the City of Cebu
56	Ynchausti Commercial House / Museum of Philippine Economic History	Iloilo City, Iloilo	1905	Commercial-Banking	Adaptive re-use as the Museum of Philippine Economic History	Marked Structure, NHCP
57	Yutivo and Sons Building	City of Manila, Metro Manila	1922	Commercial-Hardware and Retail	In active use	Registered Property, City of Manila
Infrastructure - Irrigation						
58	Hacienda de Binan Irrigation System: Presa de Calaboso / Timbao Dam, Soro-soro Dam	Binan, Laguna	c1824	Infrastructure-Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
59	Hacienda de Calamba Irrigation System: Campana, San Cristobal Dam, San Juan Dam	Calamba, Laguna	c1780-1895	Infrastrcture- Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10067
60	Hacienda de Imus Irrigation System: Pasong Buaya, Pasong Castila, Pasong Santol (Imus, Cavite); Ligas Dam, Molino Dam (Bacoor, Cavite); Casundit Dam, Dasmarinas Dam, Hasaan Dam, Prinsang Bago (Dasmarinas, Cavite)	Cavite Provice	c1780-1895	Infrastrcture- Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10068
61	Hacienda de Naic Irrigation System: Tatalon Dam, Timbungan Dam	Naic, Cavite	c1780-1895	IInfrastrcture- Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10069
62	Hacienda de San Francisco Malabon Irrigation System: Gutieres Dam, Inbubuyog Dam, Kuminoy Dam, Lesiderio Dam, Man Dam,	Cavite Provice	c1780-1895	Infrastrcture-Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10070

	Matanda Dam / Presa de la Hacienda, Nag-taob Dam, Pajo Dam, Pasong Baka Dam, Patay na Ilat Dam, Rincon Dam, Singo Dam, Tres Cruces Dam (Tanza, Cavite); Quintana Dam (Trece Martires, Cavite); Bayan Dam, Butas Dam, Marcelo Dam, Munti Dam, Plucena Dam, Pricillian Dam, Vargas Dam (Gen. Trias, Cavite)					
63	Hacienda de Santa Rosa Irrigation System: Salang Bago, Macabling Dam	Santa Rosa, Laguna	c1824	Infrastrcture- Irrigation	In limited active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
Infrastructure - Navigation						
64	Ambulong Island Lighthouse	San Jose, Occidental Mindoro	1907	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
65	Arboledan Point Lighthouse	Currimao, Ilocos Norte	1906	Infrastructure - Navigation (lighthouse)	Inactive	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
66	Bagacay Point Lighthouse	Liloan, Cebu	1857	Infrastructure - Navigation (lighthouse)	Ruins	National Historical Landmark, NHCP
67	Bagacay Point Lighthouse	Liloan, Cebu	1905	Infrastructure - Navigation (lighthouse)	In active use	National Historical Landmark, NHCP
68	Bagatao Island Lighthouse	Magallanes, Sorsogon	1904	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
69	Balanacan Lighthouse	Mogpog, Marinduque	1917	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
70	Balicasag Island Lighthouse	Panglao, Bohol	1909	Infrastructure - Navigation (lighthouse)	Inactive	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
71	Baltasar Island Lighthouse	Gasan, Marinduque	1906	Infrastructure - Navigation (lighthouse)	In active use; Ruins of keeper's house existing	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
72	Batag Island Lighthouse	Laoang, Northern Samar	1907	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Province of Northern Samar

73	Bolinao Harbor Light	Bolinao, Pangasinan	1905	Infrastructure - Navigation (lighthouse)	In active use	Local cultural property
74	Bugui Point Lighthouse	Aroroy, Masbate	1903	Infrastructure - Navigation (lighthouse)	Ruins of keeper's house existing	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
75	Cabilao Island Lighthouse	Loon, Bohol	late 19th century	Infrastructure - Navigation (lighthouse)	Unknown	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
76	Cabilison Island	Almagro, Samar	1930s	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
77	Cabra Island Lighthouse	Lubang, Occidental Mindoro	1889	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Lubang, Occidental Mindoro
78	Calabazas Island Lighthouse	Ajuy, Iloilo	1892	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Ajuy, Iloilo
79	Candon Lighthouse	Candon, Ilocos Sur	1950	Infrastructure - Navigation (lighthouse)	Site open, tower closed	unknown; over 50 years old; Presumed Important Cultural Property, RA 10071
80	Canimog Island Lighthouse	Mercedes, Camarines Norte	1927	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Province of Camarines Norte
81	Cape Bojeador Lighthouse	Burgos, Ilocos Norte	1892	Infrastructure - Navigation (lighthouse)	In active use; modernised	National Cultural Treasure, National Museum; National Historical Landmark, NHCP; Local Cultural Property - Cultural and Historical Heritage of the Province of Ilocos Norte; Registered Property, Province of Ilocos Norte; Registered Property, Municipality of Burgos, Ilocos Norte
82	Cape Bolinao Lighthouse	Bolinao	1905	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Bolinao, Pangasinan
83	Cape Engaño Lighthouse	Santa Ana, Cagayan	1892	Infrastructure - Navigation (lighthouse)	In active use	Important Cultural Property, National Museum; Marked Structure, NHCP
84	Cape Melville Lighthouse	Balabac, Palawan	1892	Infrastructure - Navigation (lighthouse)	In active use	National Historical Landmark, NHCP; Registered Property, Province of Palawan
85	Cape San Agustin / Lavigan Lighthouse	Mati, Davao Oriental	1920s; 1950s	Infrastructure - Navigation (lighthouse)	Inactive; used for climbing	Local cultural property
86	Cape Santiago Lighthouse	Calatagan, Batangas	1890	Infrastructure - Navigation (lighthouse)	In active use	Marked Structure, NHCP; Registered Property, Province of Batangas; Registered Property, Municipality of Calatagan, Batangas
87	Capitancillo Lighthouse	Bogo, Cebu	1942	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, City of Bogo, Cebu
88	Capones Island Lighthouse	San Antonio, Zambales	1890	Infrastructure - Navigation (lighthouse)	In active use; restored 2004	Important Cultural Property listing

88	Capones Island Lighthouse	San Antonio, Zambales	1890	Infrastructure - Navigation (lighthouse)	In active use; restored 2004	Important Cultural Property listing
89	Capul Island Lighthouse	Capul, Northern Samar	1896	Infrastructure - Navigation (lighthouse)	In active use	National Historical Landmark, NHCP; Registered Property, Province of Northern Samar
90	Castilla Lighthouse	Castilla, Sorsogon	1926	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Castilla, Sorsogon
91	Catbalogan Parola	Catbalogan City, Samar	1935	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, City of Catbalogan, Samar
92	Cebu Capitol Light	Cebu City, Cebu		Infrastructure - Navigation (lighthouse)		
93	Corregidor Island Lighthouse	Corregidor, Cavite	1853;1950	Infrastructure - Navigation (lighthouse)	1853 lost to WW2; 1950 in active use	Registered Property, City of Cavite
94	Divinubo Island Parola	Borongan, Eastern Samar	1906 (reactivated)	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
95	Port Miller Lighthouse	Brooke's Point, Palawan	1850	Infrastructure - Navigation (lighthouse)	Inactive, endangered by beach erosion	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
96	Gigantes Norte Island Lighthouse	Carles, Iloilo	1895	Infrastructure - Navigation (lighthouse)	Ruins of keeper's house existing	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
97	Gorda Point Lighthouse	San Agustin, Romblon	1930	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
98	Guisi Point Lighthouse/ Lusaran Point Lighthouse	Sitio Guisi, Barangay Dolores, Nueva Valencia, Guimaras	1894	Infrastructure - Navigation (lighthouse)	Ruins	Registered Property, Province of Guimaras
99	Hermana Mayor Lighthouse	Santa Cruz, Zambales	1914	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
100	Jintotolo Island Lighthouse	Balud, Masbate	1903	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
101	Jolo Harbor Lighthouse	Jolo, Sulu	1879	Infrastructure - Navigation (lighthouse)	Inactive, reused as mosque	Local cultural property
102	Linao Point Lighthouse	Aparri, Cagayan	1896	Infrastructure - Navigation (lighthouse)	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
103	Little Santa Cruz Island Lighthouse	Zamboanga City	1906	Infrastructure - Navigation (lighthouse)	Unknown	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
104	Lucap Lighthouse	Alaminos City, Pangasinan	1926-1944	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, City of Alaminos, Pangasinan

105	Mahatao Light Tower	Mahatao, Batanes	1879	Infrastructure - Navigation (lighthouse)	In active use	Local Cultural Property - Important Historical and Cultural Possessions, Municipality of Mahatao, Batanes (per Ordinance No. 20-17, series of 2020); Registered Property, Municipality of Mahatao, Batanes
106	Malabrigo Point Lighthouse	Lobo, Batangas	1896	Infrastructure - Navigation (lighthouse)	In active use	National Historical Landmark, NHCP
107	Maniguin Island Lighthouse	Culasi, Antique	1906	Infrastructure - Navigation (lighthouse)	Decommissioned	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
108	Manigonigo Island Lighthouse	Carles, Iloilo	1894	Infrastructure - Navigation (lighthouse)	Ruins of keeper's house existing	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
109	Muelle Osmena Lighthouse	Cebu City, Cebu	date unknown, late 19th c	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
110	Nuestra Senora de Inmaculada Concepcion Belfry Light	Guiuan, Eastern Samar	date unknown, early 20th c	Infrastructure - Navigation (lighthouse)	Ruins; destroyed by Typhoon Yolanda	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
111	Pandan Lighthouse	Caoayan, Ilocos Sur	1906	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Caoayan, Ilocos Sur
112	Pata Point Lighthouse	Claveria, Cagayan	1909	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of Claveria, Cagayan
113	Poro Point Lighthouse	San Fernando, La Union	1885; 1979	Infrastructure - Navigation (lighthouse)	In active use	Marked structure, NHCP
114	Sabang Point Lighthouse	Romblon, Romblon	1904	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
115	Sabangan Point Lighthouse	Agno, Pangasinan	c1920	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
116	Sablayan Point Lighthouse (Bundok Bayan/ Pressing Park)	Sablayan, Occidental Mindoro	1861	Infrastructure - Navigation (lighthouse)	Decommissioned	Local Cultural Property - Historical Marker of the Municipality of Sablayan
117	Saluag Island Lighthouse	Sibutu, Tawi-Tawi	date unknown, early 20th c	Infrastructure - Navigation (lighthouse)	As of 2016, standing, status unknown	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
118	San Bernardino Island Lighthouse	Bulusan, Sorsogon	1896	Infrastructure - Navigation (lighthouse)	In active use, tower renovated; other buildings in ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
119	San Jose Lighthouse	San Jose de Buenavista, Antique	1916	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Municipality of San Jose de Buenavista, Antique
120	Siete Pecados Lighthouse	Buenavista, Guimaras	1884; 1904	Infrastructure - Navigation (lighthouse)	1884 lost; 1904 in ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

121	Simara Island Lighthouse	Corcuera, Romblon	date unknown, early 20th c	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
122	Sueste Point Lighthouse	Subic, Zambales	1905	Infrastructure - Navigation (lighthouse)	Site open, tower closed	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
123	Suluan Island Lighthouse	Guiuan, Eastern Samar	1909	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
124	Tagulo Point Lighthouse	Dapitan, Zamboanga del Norte	1911	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
125	Tailon / Parola Island Lighthouse	Jose Panganiban, Camarines Norte	1920s	Infrastructure - Navigation (lighthouse)	In active use	Registered Property, Province of Camarines Norte
126	Tanguingui Island Lighthouse	Bantayan, Cebu	1903;1994	Infrastructure - Navigation (lighthouse)	Tower replaced in 1994; dwellings are in ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
127	Tubbataha Reef Lighthouse	Cagayancillo, Palawan	1938;1980	Infrastructure - Navigation (lighthouse)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Food Processing- Flour						
128	General Milling Corporation	Pasig City, Metro Manila	1961	Food Processing- flour	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
129	Universal Robina Corporation (Agro Industrial Group UCP Plant)	Pasig City, Metro Manila	1961	Food Processing- flour	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
130	Wellington Flour Mills	Pasig City, Metro Manila	1958	Food Processing- flour	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Mining - Gold						
131	Benguet Mining Corporation: Acupan, Antamok,	Itogon, Benguet	1903	Mining - gold	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
132	Benguet Mining Corporation: Balatoc	Itogon, Benguet	1903	Mining - gold	Converted to show mine and museum	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
133	Carmen Copper Heritage Center	Toledo, Cebu	1953	Mining - copper	Adaptive re-use as museum and heritage centre	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
134	Lepanto Consolidated Mining	Mankayan, Benguet	1936	Mining - gold	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

Agricultural						
135	Camp Phillips and Del Monte Pineapple Plantation	Manolo Fortich, Bukidnon	1926	Agricultural-Pineapples	In active use; open to the public	Del Monte Lodge as Local Cultural Property - Local Cultural Heritage, Manolo Fortich
136	Casa Hacienda de Naic	Naic, Cavite	1930	Agricultural-Abaca, Cotton	Adaptive re-use as museum	Marked structure, NHCP
137	Furukawa Abaca Plantation and Housing	Toril, Davao	1914	Agricultura l-Abaca	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Government						
138	Aduana (Customs Building)	Cebu City, Cebu	1910	Government - port/customs	Adaptive re-use as museum	National Cultural Treasure, National Museum
139	Compania Maritima	Cebu City, Cebu	1910	Infrastructure - ports	Abandoned, ownership disputed	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
140	Iloilo Customs House	Iloilo City, Iloilo	1916	Government - port/customs	Adaptive re-use as museum	Marked Structure, NHCP
141	Bureau of Customs Building	City of Manila, Metro Manila	1937	Government - port/customs	In active use	Important Cultural Property, National Museum; Marked Structure, NHCP
142	Muelle Loney/ Ang Daungan ng Iloilo	Iloilo City, Iloilo	1855	Infrastructure - ports	In active use	Marked Structure, NHCP
Infrastructure - Electricity						
143	Agus VI Hydroelectric Plant	Iligan City, Lanao del Norte	1953	Infrastructure- Electricity (hydro)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
144	Agusan 2 Hydroelectric Power Plant	Manolo Fortich, Bukidnon	1956	Infrastructure- Electricity (hydro)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
145	Ambuklao Hydroelectric Power Plant	Bokod, Benguet	1956	Infrastructure- Electricity (hydro)	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
146	Bataan Nuclear Power Plant	Morong, Bataan	1976	Infrastructure- Electricity (hydro)	Maintained but not in use	Work of National Artist for Architecture Jose Maria V. Zaragoza
147	Arsenio Escudero Hydroelectric Power Plant	Tiaong, Quezon	1938	Infrastructure- Electricity (hydro)	Decommissioned, now preserved as part of resort	Marked Structure, NHCP
Infrastructure - Railways						
148	Agdanganan Train Station	Agdanganan, Quezon	1916	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
149	Aliji Station	Tagkawayan, Quezon	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio

150	Angeles Train Station	Angeles, Pampanga	1892	Infrastructure - Railways	Partial ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
151	Apalit Train Station	Apalit, Pampanga	1892	Infrastructure - Railways	Partial ruins, no roof	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
152	Aringay Train Station	Aringay, La Union	1912	Infrastructure - Railways	Ruins	Registered Property, Municipality of Aringay, La Union
153	Aringay-Baguio Line	Tuba and Baguio City	1912	Infrastructure - Railways	Decommissioned	Registered Property, Municipality of Aringay, La Union
154	Bamban Train Station	Bamban, Tarlac	1892	Infrastructure - Railways		
155	Barasoain y Malolos Train Station	Malolos, Bulacan	1891	Infrastructure - Railways	In active use by the Philippine National Railways	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
156	Bauang Railway Bridge	Bauang, La Union	1929	Infrastructure - Railways		
157	Bayambang Train Station	Bayambang, Pangasinan	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
158	Bigaa Train Station (Balagtas Station)	Balagtas, Bulacan	1891	Infrastructure - Railways	Intact, being rehabilitated with Manila-Clark Railway	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
159	Calasiao Train Station	Calasiao, Pangasinan	1892	Infrastructure - Railways	Intact as a community multipurpose hall	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
160	Caloocan Train Station	Caloocan City	1891	Infrastructure - Railways	Partially demolished	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
161	Calulut Train Station	San Fernando, Pampanga	1923	Infrastructure - Railways		unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
162	Calumpit Train Station	Calumpit, Bulacan	1891	Infrastructure - Railways	Intact; for restoration	Registered Property, Province of Bulacan
163	Capas Train Station	Capas, Tarlac	1892	Infrastructure - Railways	Intact	Marked Structure, NHCP; Registered Property, Province of Tarlac
164	Dagupan Train Station	Dagupan, Pangasinan	1892	Infrastructure - Railways	Partial ruins, walls intact	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
165	Damortis Train Station	Rosario, La Union	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio
166	Dau Train Station	Mabalacat, Pampanga	1902; 1919	Infrastructure - Railways	Unknown, possibly ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
167	Duhat Station	Plaridel, Quezon	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio
168	Gerona Train Station	Gerona, Tarlac	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
169	Guiguinto Train Station	Guiguinto, Bulacan	1891	Infrastructure - Railways	Ruins	Registered Property, Province of Bulacan

170	Hinulugang Taktak Station	Antipolo City, Rizal	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio
171	Labangan Railway Bridge	Calumpit, Bulacan	1900s	Infrastructure - Railways		unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
172	Libmanan Train Station	Libmanan, Camarines Sur	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio
173	Lucena Train Station	Lucena City	1938	Infrastructure - Railways	Intact; needs roof replacement	Work of National Artist for Architecture Pablo S. Antonio
174	Mabalacat Train Station	Mabalacat, Pampanga	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
175	Malasiqui Train Station	Malasiqui, Pangasinan	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
176	Mangaldan Train Station	Mangaldan, Pangasinan	1908; 1919	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
177	Mauca Railroad Bridge	Ragay, Camarines Sur	1900s	Infrastructure - Railways	Disused; open to makeshift trolleys	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
178	Meycauayan Train Station	Meycauayan, Bulacan	1892	Infrastructure - Railways	Disused; possibly inhabited by informal settlers	Registered Property, Province of Bulacan
179	Moncada Train Station	Moncada, Tarlac	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
180	Paco Train Station	Manila	1915	Infrastructure - Railways	Partial ruins	Registered Property, City of Manila
181	Paniqui Train Station	Paniqui, Tarlac	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
182	Polo Train Station	Valenzuela	1899	Infrastructure - Railways	In use as police station	Marked Structure, NHCP; Local Cultural Property - City Cultural Property, Valenzuela City (per Ordinance No. 476, series of 2018); Registered Property, City of Valenzuela
183	San Carlos Train Station	San Carlos, Pangasinan	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
184	San Fabian Train Station	San Fabian, Pangasinan	1938	Infrastructure - Railways	Ruins	Work of National Artist for Architecture Pablo S. Antonio
185	San Fernando Train Station	San Fernando, Pampanga	1892	Infrastructure - Railways	In use as the Old Train Station Museum	Marked Structure, NHCP; Registered Property, City of San Fernando
186	San Pablo de los Montes Station	San Pablo, Laguna	1908	Infrastructure - Railways	Ruins	Registered Property, City of San Pablo, Laguna
187	Santo Tomas Train Station	Santo Tomas, La Union	1900s	Infrastructure - Railways	Ruins	Registered Property, Municipality of Santo Tomas, La Union
188	Tarlac Train Station	Tarlac, Tarlac	1892	Infrastructure - Railways	Ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
189	Tutuban Train Station	Manila	1892	Infrastructure - Railways	Adaptive re-use as commercial establishments	Marked Structure, NHCP

Metallurgy						
190	Iligan Integrated Steel Mills	Iligan City, Lanao del Norte	1952	Metallurgy- Iron & Steel	Defunct, ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
191	National Shipyard and Steel Corporation	Mariveles, Bataan	1950	Metallurgy- Iron & Steel	Defunct, ruins	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Food Processing - Sugar						
192	Binalbagan Isabela Sugar Company Complex	Binalbagan, Negros Occidental	1930s	Food Processing-Sugar, Industrial Communities	Intact and conserved, in active use	Company complex including chapel, mincipal hall, hospital listed as local heritage: Registered Property, Province of Negros Occidental
193	Central Azucarera de Bais	Bais City, Negros Oriental	1900s	Food Processing-Sugar, Industrial Communities	Individual houses have undergone restoration; actual Central Azucarera intact and conserved, in active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
194	Central Azucarera de La Carlota Complex	La Carlota City, Negros Occidental	1916	Food Processing-Sugar, Industrial Communities	Intact and conserved, in active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
195	Central Azucarera de Tarlac	Tarlac, Tarlac	1927	Food Processing-Sugar, Industrial Communities	Intact and conserved, in active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
196	Central Azucarera Don Pedro	Nasugbu, Batangas	1927	Food Processing-Sugar, Industrial Communities	Defunct as of 2024, at risk of demolition	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
197	Hacienda Santa Rosalia	Manapla, Negros Occidental	1930	Agriculture - Sugar	Intact and conserved	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
198	Hawaiian-Philippine Company Complex	Silay City, Negros Occidental	1918	Food Processing-Sugar, Industrial Communities	Intact and conserved, in active use	Registered Property, Silay City
199	Infante House of Hacienda del Carmen	Floridablanca, Pampanga	1873	Agriculture - Sugar	Restored	Registered Property, Province of Pampanga
200	Infante House of Hacienda Guadalupe	La Carlota, Negros Occidental	1929	Agriculture - Sugar	Intact as a Heritage House	Registered Property, Province of Negros Occidental
201	Lopez Sugar Corporation Complex	Sagay City, Negros Occidental	1927	Food Processing-Sugar, Industrial Communities	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
202	Ma-ao Sugar Central Complex	Bago City, Negros Occidental	1900	Food Processing-Sugar, Industrial Communities	Demolished despite being a declared important cultural property	Important Cultural Property since 2017

203	Montilla – Suatengco Ancestral House, Hacienda Ubay	Pulupandan, Negros Occidental	1800s	Food Processing-Sugar, Industrial Communities	Conserved together with hacienda environs	Registered Property, Province of Negros Occidental
204	San Carlos Milling Company Executive and Staff Housing	San Carlos City, Negros Occidental	1912	Food Processing-Sugar, Industrial Communities	Unknown	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
205	Sugar Simborios (Smokestacks of Negros Occidental)	Bago City, Binalbagan, Calatrava, La Carlota, Silay	1800s	Food Processing - Sugar	Various; Ruins conserved as park; some intact but disused	Important Cultural Property, National Museum; Marked Structure, NHCP; Registered Property, Province of Negros Occidental
206	Sugar Simborios (Smokestacks in San Jose and Quebiawan)	San Fernando, Pampanga	1800s	Food Processing - Sugar	Unknown	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
207	Victorias Milling Corporation Complex	Victorias City, Negros Occidental	1919	Food Processing-Sugar, Industrial Communities	Intact and conserved, in active use	Registered Property, Province of Negros Occidental; church declared Important Cultural Property, National Museum; Registered Property, Province of Negros Occidental
208	Sugar Simborios of Iloilo Province	Namocon, Tugbauan; Catiringan, Igbaras; Jovellar, Igbaras; Particion, Guimbal; Camangahan, Guimbal; Bacan, Cabatuan; Lasakan, Cabatuan; Mandog, Maasin; Matag-ob, Janiuay; Balanac, Janiuay; Danao, Janiuay; Tambal, Janiuay; Bongol Proper, Janiuay; Dabong, Janiuay; Agmanaphao, Mina; Tumay, Mina; Palanguia, Pototan; Inataluan, Pototan; Inili-gan, Badiangan; Malag-it, Calinog; Anilao, Palaypay, Anilao; Carmelo, Banate; Angare, Duenas; Jaguimit, Duenas; Poblacion C., Duenas; Ilahas, Dingle; Sinba-an, Dingle; Barotac Nuevo; Rosario, Dumangas; Bantud Fabrica, Dumangas; PD Monfort, Dumangas; Lacturan,	c1904-1940s	Food Processing - Sugar	In various states of abandonment, within villages, forests, in fields, and incorporated into residential structures	Most identified by local tourism offices and are Local Cultural Properties

		Dumangas; Quinagaringan Pequeno, Passi City; Imbang Grande, Passi City; Agtambo, Passi City; Sto. Tomas, Passi City; Nueva Union, Passi City; Camiri, San Enrique; Cubay, San Enrique; Paga, San Enrique; Quinolpan, San Enrique; Dumiles, San Enrique; Rumagayray, San Enrique; Lanjagan, Ajuy; Sitio Kisamata, Central, Ajuy; Terraa Verde, Ajuy; Sitio Pangpang, Poblacion, Ajuy; Apologista, Sara; Labigan, Sara; Zerrudo, Sara; Preciosa, Sara; Villa Panian, Estancia; Estancia; Carles; Catmon, Carles				
Agricultural - Tobacco						
209	Hacienda San Antonio	Ilagan, Isabela	1895	Agriculture - Tobacco; Industrial Communities	Structure intact; in need of conservation	over 50 years old; Presumed Important Cultural Property, RA 10066
210	Hacienda San Luis Eco-Tourism Park and the buildings found therein: Tabacalera, Casa and Edificio Administrativo	Currimao, Ilocos Norte	1887	Agriculture - Tobacco; Industrial Communities	Adaptive re-use as an eco-park, museum, and resort	"Local Cultural Property - Local Heritage or Legacy Buildings: Historical and Cultural Sites and Buildings of the City of Cauayan "
211	Tabacalera House	San Fernando, Pampanga	19th century	Tobacco	Structure intact; in need of conservation	Registered Property, City of San Fernando
212	Tabacalera Warehouse	Currimao, Ilocos Norte	19th century	Tobacco	Ruins	Registered Property, Municipality of Currimao, Ilocos Norte
213	Tabacalera (Museo Ilocos Norte)	Laoag City, Ilocos Norte	19th century	Tobacco	Adaptive re-use as the Museo Ilocos Norte	Local Cultural Property - Cultural and Historical Heritage of the Province of Ilocos Norte (per Provincial Ordinance Nos. 049-2006 and 039-2009)
214	Tobacco Monopoly Monument	Laoag City, Ilocos Norte	"1782- Tobacco Monopoly 1958- Statue Unveiled"	Tobacco	Monument maintained	Marked Structure, NHCP; Registered Property, City of Laoag, Ilocos Norte

Infrastructure - Water Supply						
215	Ang Panubli-on	Roxas City, Capiz	1910	Infrastructure-Water Supply	Adaptive re-use as Roxas City Museum	Local Cultural Property of Roxas City, Capiz
216	Balara Filtration Plant	Quezon City, Metro Manila	1938	Infrastructure-Water Supply	In active use	Registered Property, Quezon City
217	El Deposito	San Juan City, Metro Manila	1882	Infrastructure-Water Supply	Adaptive re-use as the El Deposito Museum	Marked Structure, NHCP; Registered Property, City of San Juan
218	Carriedo Waterworks	Quezon City, City of Manila, Metro Manila	1882	Infrastructure-Water Supply	Disused, fountain conserved as statue	Marked Structure, NHCP; Restoration by National Artist for Visual Arts Napoleon V. Abueva; Registered Property, Quezon City
219	Traida de Aguas	Romblon, Romblon	1864	Infrastructure-Water Supply	Disused, fountain conserved as statue	National Cultural Treasure, National Museum
220	Aguas Potables - American Period Water Towers (Serial)	Various Locations	1920s, American Colonial Period	Infrastructure-Water Supply	Most structures disused, adaptive re-use as local museums, government offices, or abandoned	over 50 years old; Presumed Important Cultural Property, RA 10066
Ceramics						
221	Brick Horno	Camalaniugan and Tuguegarao, Cagayan	16th to 17th century	Ceramics - bricks	Disused	Local Cultural Property - Important Cultural Property of the Municipality of Camalaniugan, Province of Cagayan (per Ordinance No. 2019-001), Registered Property, Municipality of Camalaniugan, Cagayan
222	Brick Horno	Dupax del Sur, Nueva Vizcaya	16th to 17th century	Ceramics - bricks	Disused	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
223	Brick Horno	Alubijid, Misamis Oriental	~ 1886-1892	Ceramics - bricks	Abandoned	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
224	Sawmill - unknown	San Teodoro, Oriental Mindoro	1926	Forest Industries - Timber Processing	Abandoned	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
202	Ma-ao Sugar Central Complex	Bago City, Negros Occidental	1900	Food Processing-Sugar, Industrial Communities	Demolished despite being a declared important cultural property	Important Cultural Property since 2017
225	Lime kilns (2)	Morobuan, Jordan, Guimaras	after 1850s	Lime burning	Abandoned	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
226	Lime kilns of Buenavista	Buenavista, Guimaras	after 1850s	Lime burning	Abandoned	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

Telecommunication						
227	Bureau of Posts Transmitting Station	Valenzuela City, Metro Manila	1946	Telecommunications	In active use as DICT-Valenzuela Campus	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Military						
228	Department of Military Science & Tactics Reserve Officers Training Corps (MMST-ROTC)	Los Baños, Laguna	1945	Military - education & training	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
Agriculture						
229	University of the Philippines Los Baños College of Agriculture and Food Sciences	Los Baños, Laguna	1909; 1972	Agriculture - Industrial Communities, Research	In active use	Marked Structure, NHCP; Work of National Artist for Landscape Architecture Ildefonso P. Santos
230	International Rice Research Institute	Los Baños, Laguna	1960	Agriculture - Rice, Industrial Communities, Research	In active use	Marked Structure, NHCP
231	Campus of the University of the Philippines Los Baños	Municipalities of Los Baños and Bay, Laguna	1909	Agriculture - Food & drink Processing, Industrial Communities- Education	In active use	Registered Property, Municipality of Los Baños, Laguna
221	Brick Horno	Camalaniugan and Tuguegarao, Cagayan	16th to 17th century	Ceramics - bricks	Disused	Local Cultural Property - Important Cultural Property of the Municipality of Camalaniugan, Province of Cagayan (per Ordinance No. 2019-001), Registered Property, Municipality of Camalaniugan, Cagayan
232	Ohta Kyozaburo Monument	Davao City, Davao	1926	Industrial Communities - Abaca	Existing; maintained as monument	Marked Structure, NHCP; Registered Property, Davao City
233	Barangay Mintal Japanese Heritage SIte	Davao City, Davao	1900s	Industrial Communities - Abaca	Several structures intact; adaptively reused as residential and institutional structures	Local Cultural Property - Japanese Heritage Site, Davao City
234	Silay Old Seaport Ruins	Silay City, Negros Occidental	1894; retrofitted 1933	Infrastructure - Ports	Ruins	Registered Property, Province of Negros Occidental
235	Charles Fuller Baker Hall	Los Baños, Laguna	1927-1938	Agriculture - Food & drink Processing, Industrial Communities- Education	In active use	Marked Structure, NHCP

236	Nemesio B. Mendiola Hall former Department of Agronomy Soil Horticulture (Old)	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
237	UNIVERSITY POLICE FORCE BUILDING	Los Baños, Laguna	1945	Government - Police, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
238	COLLEGE OF ECONOMICS & MANAGEMENT	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
239	AGRICULTURAL EDUCATION & RURAL STUDIES BUILDING	Los Baños, Laguna	1909; 1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
240	Institute of Human Nutrition Studies (IHNF) former Home Technology Deparment	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
241	Depart. Of Human & Family Studies (HFDS) former Human & Family Devt. Studies	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
242	CHILD DEVELOPMENT LABORATORY & NURSERY	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
243	UPLB RURAL HIGH SCHOOL (OLD) - IMSP	Los Baños, Laguna	1945	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
244	DAIRY TRAINING & RESEARCH INSTITUTE (CAFS-DTRI)	Los Baños, Laguna	1960	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
245	MUSEUM OF NATURAL HISTORY	Los Baños, Laguna	1960	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

246	Francisco I. Hilario Hall former Ornamental Crops Nursery Building	Los Baños, Laguna	1968	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
247	Dioscoro L. Umali Hall	Los Baños, Laguna	1965	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	Work of National Artist Leandro Locsin
248	University Planning and Maintenance Office (UPMO) formerly Campus Planning,	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
249	SUPPLY & PROPERTY MANAGEMENT OFFICE	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
250	A.G. Samonte Hall Former UPLB Central Adminitration Building	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
251	INTERNATIONAL HOUSE (MEN'S DORM) BUILDING	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
252	COLLEGE OF ARTS & SCIENCES BUILDING (HUMANITIES BLDG.)	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
253	Nora C. Quebral Hall of the College of Development Communication	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
254	School of Environmental Science & Management former Inst.of Envir. Science & MGT. Bldg.	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

255	Leopoldo B. Uichanco Hall former Biological Science Bldg.	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
256	Gil F. Saguguit Sr, former College of Human Ecology (Old Entomology Depart. Bldg.)	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
257	COLLEGE OF ENG'G & AGRO-INDUSTRIAL TECHNOLOGY-CEAT (Dept. of Engr. Science)	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
258	AGRO-SOILS	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
259	UPLB CENTRAL MEN'S RESIDENCE HALL	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
260	UPLB-CF PAVILION BUILDING	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
261	UPLB-CF MBG OFFICE/LABORATORY BUILDING	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
262	UPLB-CF MEN'S DORMITORY BUILDING	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
263	UPLB-CF SAWMILL SHOP BUILDING (OLD)	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066

264	UPLB-CF FOREST TECHNOLOGY BUILDING	Los Baños, Laguna	1970	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
265	STUDENT UNION	Los Baños, Laguna	1971	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	Work of National Artist Leandro Locsin
266	Francisco O. Santos Hall former Physical Science Building	Los Baños, Laguna	1971	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
267	UNIVERSITY HEALTH SERVICE	Los Baños, Laguna	1971	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown; over 50 years old; Presumed Important Cultural Property, RA 10066
268	BIENVENIDO M. GONZALEZ HALL (UPLB Main Libray & Executive Offices)	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown
269	LIMNOLOGICAL STATION BUILDING	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown
270	UPLB-CF LIBRARY AND INFORMATION BUILDING	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown
271	UPLB-CF AUDITORIUM BUILDING	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	Work of National Artist Leandro Locsin
272	UPLB-CF WST WOOD PROCESSING BUILDING	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown

273	UPLB-CF MESS HALL AND DORMITORY BUILDING	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown
274	CENTRAL EXPERIMENT STATION/ FARM OPERATION DIVISION	Los Baños, Laguna	1978	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	unknown
275	Rizal Centenary Carillon	Los Baños, Laguna	1996	Agriculture - Food & drink Processing, Industrial Communities - Education	In active use	Work of National Artist Leandro Locsin

Singapore

N°	Name of the property	Location	Year of establishment	Typology of industry	State of Conservation	Legal Protection
1	Kallang Gasworks	bounded by Kallang Road, Crawford Street, Kampong Bugis, and the Rochor River	1862	Infrastructure - Gas	No	Unprotected
2	Ford Factory	along Upper Bukit Timah Road	1926	Automotive	Yes	Conserved
3	St James Power Station	along Keppel Road	1927	Infrastructure - Electricity	Yes	National Monument
4	Malayan Motors Showroom	along Orchard Road	1927	Commercial - automotive	Yes	Conserved
5	National Aerated Water Factory	Serangoon Road	1929	Food processing - water	Yes	Conserved
6	Jellicoe Road Warehouses	82 Jellicoe Road	late 1920s	Commercial	Yes	Conserved
7	Tanjong Pagar Railway Yard	30 Keppel Road	1932	Infrastructure - railways	Yes	National Monument
8	Malayan Breweries	Alexandra Road	1932	Food processing - brewing	No	Unprotected
9	Anchor Brewery	Alexandra Road	1933	Food processing - brewing	Yes	Conserved
10	Old Kallang Airport Hangars	Kallang Airport Way	1937	Infrastructure - Aviation	Yes	Conserved
11	H.M. Naval Base (Former) – now Sembawang Shipyards (1930s)	Admiralty Road West	1938	Military - Shipbuilding & Repair	No	Unprotected

12	Khong Guan Biscuit Factory	MacTaggart Road No. 2	1952	Food processing - biscuits	Yes	Conserved
13	Pasir Panjang Power Station	27 Pasir Panjang Road	1953	Infrastructure - Electricity	No	Unprotected
14	George Street Telephone Exchange	8 George Street	1954	Telecommunications	No	Unprotected
15	Kwong Yuen Cheong building	junction of King George's Avenue and Maude road	1955	Housing	Yes	Conserved
16	Lee Rubber Godown at Kallang	161 Lavender Street	1956	Forest industries - Rubber	Yes	Conserved
17	Harvey Rd Shophouse/ Factory	intersection of MacPherson Road and Harvey Road	1956	Tobacco	No	Unprotected
18	Lea Hin Building	293 Alexandra Road	1960	Commercial - engineering	No	Unprotected
19	Pulau Bukom Complex	Pulau Bukom	1960	Petroleum	No	Unprotected
20	National Iron & Steel Mills Offices (MAC)	Jurong Industrial Estate	1961	Metallurgy - steel	No	Unprotected
21	Prima Tower & Flour Mills	201 Keppel Rd	1963	Food processing. - flour	No	Unprotected
22	Singapore Conference Hall & Trades Union House	7 Shenton Way	1965	Trade Unionism	Yes	National Monument
23	Jurong Port	Along Jurong Port Road	1965	Commercial - port	No	Unprotected
24	Tanglin Halt Flatted Factory	115A/115B Commonwealth Drive	1965	Light Industry	No	Unprotected
25	The Singapore Mint (Alfred Wong)	Teban Gardens Crescent	1968	Mint	No	Unprotected
26	Port Worker's Union House	Cantonment Road	1969	Trade Unionism	No	Unprotected
27	Haw Par Industrial Building	401 Commonwealth Drive	1969	Forest industries - medicine	No	Unprotected
28	McGraw-Hill Far Eastern Press Building (BEP)	Jurong Industrial Estate	1969	Printing/Publishing	No	Unprotected
29	Texas Instruments Bldg	Kallang Basin	1969	Electronics	No	Unprotected
30	Factory at Kim Yam Road	Kim Yam Road	1969	Education & Training - high-school		
31	Jurong Hill Park and Tower	60 Jurong Hill	1970 and 1969	Recreation	No	Unprotected

28	McGraw-Hill Far Eastern Press Building (BEP)	Jurong Industrial Estate	1969	Printing/Publishing	No	Unprotected
29	Texas Instruments Bldg	Kallang Basin	1969	Electronics	No	Unprotected
30	Factory at Kim Yam Road	Kim Yam Road	1969	Education & Training - high-school		
31	Jurong Hill Park and Tower	60 Jurong Hill	1970 and 1969	Recreation	No	Unprotected
32	Singapore Textile Industries	200 Jalan Sultan Rd	1970	Textiles	No	Unprotected
33	Singapore Offshore Petroleum Services	25 loyang crescent	1970	Petroleum	No	Unprotected
34	Supreme House	Along Penang Road	1971	Commercial	No	Unprotected
35	Cooling Systems & Flexibles Building (BEP)	Jurong Industrial Estate	1971	Engineering - automotive	No	Unprotected
36	Jurong Vocational Institute	91 Jurong West Street	1973	Education & Training - engineering	Yes	National Monument
37	Jurong Town Hall	9 Jurong Town Hall Road	1974	Government - local	No	Unprotected
38	Telok Blangah Electrical Substation	501 Telok Blangah Rd	1974	Infrastructure - Electricity	No	Unprotected
39	Jurong Flour Mills	18 Jalan Besut	1975	Food processing - flour	No	Unprotected
40	Singapore Time Watch Factory (SEIKO Watch Factory)	2 Marsiling Lane	1976	Engineering - watches	No	Unprotected
41	Singapore Science Centre	15 Science Centre Rd	1977	Education & Training	No	Unprotected
42	Public Utilities Board HQ	111 Somerset Rd	1977	Infrastructure - water supply	No	Unprotected
43	Unity House	Along Jurong Town Hall Road	1982	Trade Unionism	No	Unprotected
44	Singapore Conference Hall & Trades Union House	7 Shenton Way	1965	Trade Unionism	Yes	National Monument
45	Port Worker's Union House	Cantonment Road	1969	Trade Unionism	No	Unprotected
46	Haw Par Industrial Building	401 Commonwealth Drive	1969	Light Industry	No	Unprotected
47	Jurong Hill Park and Tower	60 Jurong Hill	1970 and 1969	Recreation	No	Unprotected
48	Jurong Port	Along Jurong Port Road	1965	Commercial. - port	No	Unprotected
49	Rhone-Poulenc Factory & Offices	61 Gul Circle	1999	Pharmaceutical & Chemicals	No	Unprotected

Thailand

N°	Name of the property	Location	Year of establishment	Typology of industry	State of Conservation	Legal Protection
Agriculture						
1	Samut Song-kram Sea salt making area	Samut Song-kram	Ca. 17th Century	Salt	Potential danger (climate factor)	"- Town Planning Act, 2019 - Enhancement and Conserva-tion of National Environmental Quality Act, 1992"
2	Pattani Sea salt making area	Pattani coastal & wetland area?	Ca. 15th Century	Salt	Potential danger (climate factor)	"- Town Planning Act, 2019 / - Enhancement and Conserva-tion of National Environmental Quality Act, 1992"
3	Nan Rock Salt Well	Nan	Prehistoric	Salt	Potential danger	- Promotion and Conservation of Intangible Cultural Heritage Act, 2012
4	Northeast Thailand Rock salt pit	"Northeast Korat & Sakon Nakhon Plateau"	Prehistoric	Salt	Potential danger	- Promotion and Conservation of Intangible Cultural Heritage Act, 2012
5	Northeast Thai-land Fermented Fish production	Nakhon Phanom	Prehistoric	Food Processing - Fish	Ascertained danger	- Promotion and Conservation of Intangible Cultural Heritage Act, 2012
6	Rayong Fish sauce factory	Prasae, Rayong	Ca. 19th century	Food Processing - Fish	Preserved	- Enhancement and Conserva-tion of National Environmental Quality Act, 1992
7	Lanna Rice Farming	Chiang Rai	Prehistoric	Agriculture - Rice	Potential danger (climate factor / town planning factor)	"- Rice Act, 1896 - Plant Varieties Protection Act, 1999"
8	Chao Phraya Ba-sin Rice Farming	Central Thailand	Ca. 12th Century	Agriculture - Rice	Potential danger (climate factor / town planning factor)	"- Rice Act, 1896 - Plant Varieties Protection Act, 1999"
9	Northeast Rice Farming	Thung Kula Ronghai	Prehistoric	Agriculture - Rice	Potential danger (climate factor / town planning factor)	"- Rice Act, 1896 - Plant Varieties Protection Act, 1999 - Geographical Indication, 2007"
10	Pattalung Rice Farming	Pattalung	Prehistoric	Agriculture - Rice	Potential danger (climate factor / town planning factor)	"- Rice Act, 1896 - Plant Varieties Protection Act, 1999"
11	Phetchaburi Palm Sugar production knowledge and technique	Petchaburi	Prehistoric	Food Processing - Sugar	Potential danger (climate factor / urban develop-ment factor)	- Plant Varieties Protection Act, 1999
12	Samutsongkram Coconut Sugar production knowledge and technique	Samutsongkram	Prehistoric	Food Processing - Sugar	Potential danger (climate factor / urban develop-mentfactor)	- Plant Varieties Protection Act, 1999
13	Chantaburi pep-per plantation and cultivation	Chantaburi	Prehistoric	Food Processing - Pepper	Potential danger (climate factor / urban develop-mentfactor)	- Plant Varieties Protection Act, 1999

14	Palian pepper plantation and cultivation	Palian, Trang	Ca. 19 th Century	Food Processing - Pepper	Potential danger (climate factor / urban developmentfactor)	- Plant Varieties Protection Act, 1999
15	Rubber production industry heritage	Southern Thailand	1899	Forest industries - Rubber	Potential danger (climate factor / urban developmentfactor)	- Plant Varieties Protection Act, 1999
16	Edible bird's nest harvesting knowledge and technique	Koh Si & Koh Ha Islands	Ca. 18th Century	Food processing - birds nests	Potential danger (climate factor)	"- Enhancement and Conservation of National Environmental Quality Act, 1992 - Swiftlet Nest Duty Act, 1997"
17	Chiang Mai tobacco barn	Chiang Mai	1955	Tobacco	Well conserved	-
18	Tobacco Authority Office, Chiang Rai	Chiang Rai	1966	Tobacco	Well conserved	-
19	Tobacco Authority Office, Pa Sak Khwang	Pa Sak Khwang, Chiang Rai	1957	Tobacco	Well conserved	-
Forestry						
20	Phrae Basin Teak Forestry Heritage	Phrae	Ca. 19th Century	Forest industries - Teak	Ascertained Danger	
Mining						
21	Chinese tin mining heritage	Southern Thailand	15th Century	Mining - tin	Ascertained Danger	None
22	Tin dredging industry	Southern Thailand	19th Century	Mining - tin	Ascertained Danger	
23	Granite quarry	Tak		Mining - stone	Well Conserved	- Enhancement and Conservation of National Environmental Quality Act, 1992
24	Sand stone quarry	Sikhiew	Prehistoric	Mining - stone	Ascertained Danger	The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
25	Laterite quarry	"Kamphaengphet Prachinburi"	Prehistoric, and 15th/16th Century	Mining - stone	Ascertained Danger	The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
26	Marble quarry	Pak Chong, Nakhonratchasima	Prehistoric	Mining - stone		
Manufacturing						
27	Indigenous Pottery Production in Thailand	Ban Klang, Tha Uthen, Nakhon Phanom and Dan Kwein, Nakhon Ratchasima	Ca 17th Century	Ceramics	Ascertained Danger	None

28	Indigenous Pottery Production in Thailand	Ban Maw, Mahasarakham, Ban Wua Lay/ Ban Kuan Hang Dong, Chiang Mai and Ban Sathing Maw, Singhanakorn Songkhla	Prehistoric	Ceramics	Ascertained Danger	None
29	The Thai Paper Mill	Kanchanaburi	1938	Paper	Potential Danger	The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
30	SCG Cement Plant	Bang Sue, Bangkok	1913	Cement	Well conserved	None
31	"SCG Loading Centre	Bang Sue, Bangkok	20th Century	Cement	Well conserved	None
32	The Royal Thai Mint	The National Gallery of Thailand, Phranakhon, Bangkok	1902	Mint	Well conserved	The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
33	Singha Brewery	Dusit	1933	Food processing - brewing	Well conserved	None
Electricity						
34	Wat Liab Power Plant	Phra Nakhon, Bangkok	1889	Infrastructure - Electricity	Well Conserved	None
35	Khanom Electricity Generating Co. Ltd.	Khanom District, Nakhon Si Thammarat	1995	Infrastructure - Electricity	Well Conserved	None
Water Supply						
36	The “Rahad” Waterwheels of Lamtakong	Lamtakong Canal, Nakhon Ratchasima	19th Century	Infrastructure - Water supply	Potential danger (juridical, material, and craftsmanship factors)	Officially listed in the Preliminary Register of Intangible Cultural Heritage of Nakhon Ratchasima Province, 2024
37	Maen Sri Waterworks	Maen Sri, Bangkok	1914	Infrastructure - Water supply	Potential danger (lack of conservation policy)	
38	Sam Sen Waterworks	Sam Sen, Bangkok	1914	Infrastructure - Water supply	Well conserved	
Transport						
39	Bangkok Hualamphong Railway Station	Hualamphong, Bangkok	1916	Infrastructure - Railways	Well Conserved	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
40	"The Memorial Bridge"	Bangkok	1932	Infrastructure - Roads	Well Conserved	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
41	Krung Thon Bridge & Krung Thep Bridge (with bascule lift section)	Bangkok	1957 and 1959	Infrastructure - Roads	Well Conserved	?

42	Bridge over the River Kwai	Kanchanaburi	1943	Infrastructure - Railways	Well Conserved	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
43	Makkasan Railway Factory	Makkasan, Bangkok	1910	Engineering - Railways	threatening effects of regional planning projects	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
44	Thonburi Naval Dockyard		1890	Military/Shipbuilding and repair	Well Conserved	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
45	Siamese Canal System	Bangkok and peripheral areas	Ca. 18th Century	Infrastructure - Canals	Potential Danger (effects of regional planning projects)	
Accomodation & Food Service						
46	The Oriental Hotel	Bang Rak, Bangkok	1887	Commercial - Hotel	Well Conserved	None
47	Kurusapa Publishing House	Bang Lam Pu		Publishing	Well Conserved	- The Ancient Monuments, Antiquities, Art Objects and National Museums Act, 1961
48	Radio station at Wireless Road	Wireless Road, Bangkok	1913	Telecommunications	Well Conserved	None
Financial Activities						
49	Bank of Thailand's Note Printing Works	Bangkok	1969	Printing	Well Conserved	None
Public Administration						
48	Radio station at Wireless Road	Wireless Road, Bangkok	1913	Telecommunications	Well Conserved	None
Arts & Entertainment						
51	Sala Chaloem Thani	Bangkok	1918	Arts & Entertainment	Well Conserved	None
52	Sala Chaloem Krung	Bangkok	1932	Arts & Entertainment	Well Conserved	None
53	"Lumphini Hall"	Lumphini Park, Bangkok	1952	Arts & Entertainment	Well Conserved	None
54	The Film Archive	Salaya, Nakhon Prathom	1984	Arts & Entertainment	Well Conserved	- Royal Decree Establishing the Film Archive (Public Organisation) 2009
55	Rajadamnoen Muay Thai Stadium	Bangkok	1945	Arts & Entertainment	Well Conserved	None

Viet Nam

N°	Name of the property	Vietnamese name of the property	Location	Year of establishment	Typology of industry	State of Conservation	Main Product
1	Le Dynasty Canal	Kênh Nhà Lê	Ninh Bình- Hà Tĩnh	983	Infrastructure	Currently operating	Transportation and irrigation
2	Nha Trinh Dam	Đập Nha Trinh	Ninh Thuận	1150	Infrastructure	Currently operating	Transportation and irrigation
3	Vinh Te Canal	Kênh Vĩnh Tế	An Giang - Kiên Giang	1819	Infrastructure	Currently operating	Transportation and irrigation
4	Saigon Port	Cảng Sài gòn	TPHCM	1860	Infrastructure	Currently operating	Traffic
5	Hai Phong Port	Cảng Hải Phòng	Hải Phòng	1874	Infrastructure	Currently operating	Traffic
6	Saigon Water Tower	Thủy đài Sài Gòn	TPHCM	1886	Infrastructure	Currently operating	Water supply
7	Hommel Brewery	Nhà máy bia Hommel	Hà Nội	1890	Light industry	Currently operating	Beverage
8	Lo Duc Distillery	Nhà máy rượu Lò Đúc	Hà Nội	1892	Light industry	Destruction	Beverage
9	Mong Bridge	Cầu Mống	TPHCM	1893	Infrastructure	Currently operating	Traffic
10	Don Thuy Water Tower	Tháp nước Đồn Thuỷ	Hà Nội	1894	Infrastructure	Currently operating	Water supply
11	Hang Dau Water Tower	Tháp nước Hàng Đậu	Hà Nội	1894	Infrastructure	Currently operating	Water supply
12	Yen Phu Water Treatment Plant	Nhà máy nước Yên Phụ	Hà Nội	1894	Light industry	Currently operating	Water supply
13	Long Bien Bridge	Cầu Long Biên	Hà Nội	1898	Infrastructure	Currently operating	Traffic
14	Nam Dinh Textile Factory	Nhà máy Dệt Nam Định	Nam Định	1898	Light industry	Cease operations	Textiles
15	Hanoi Railway Station	Ga Hà Nội	Hà Nội	1899	Infrastructure	Currently operating	Traffic
16	Hai Phong Cement Plant	Nhà máy Xi măng Hải Phòng	Hải Phòng	1899	Heavy industry	Currently operating	Cement
17	Truong Tien Bridge	Cầu Trường Tiền	Huế	1899	Infrastructure	Currently operating	Traffic
18	Ghenh Bridge	Cầu Ghềnh	Đồng Nai	1902	Infrastructure	Currently operating	Traffic
19	Hai Phong Railway Station	Ga Hải Phòng	Hải Phòng	1902	Infrastructure	Currently operating	Traffic
20	Di An Railway Factory	Nhà máy xe lửa Dĩ An	TPHCM	1902	Heavy industry	Currently operating	Repair and build locomotive engines.
21	Gia Lam Railway Factory	Nhà máy xe lửa Gia Lâm	Hà Nội	1905	Heavy industry	Cease operations	Repair and build locomotive engines.
22	IDEO Printing Factory	Nhà máy in IDEO	Hà Nội	1907	Light industry	Change of function	Printing
23	Hue Railway Station	Ga Huế	Huế	1908	Infrastructure	Currently operating	Traffic

24	Thuy Khue Leather and Footwear Factory	Nhà máy da giầy Thuỵ Khuê	Hà Nội	1912	Light industry	Destruction	Leather tanning and shoemaking
25	Xuan Huong Lake	Hồ nước Xuân Hương	Lâm Đồng	1919	Infrastructure	Currently operating	Irrigation
26	Dai La Brick Factory	Nhà máy gạch Đại La	Hà Nội	1920	Light industry	Destruction	Brick manufacturing
27	Hai Phong Glass Factory	Nhà máy Thuỷ tinh Hải phòng	Hải Phòng	1923	Light industry	Currently operating	Bottles
28	Yen Phu Power Plant	Nhà máy điện Yên Phụ	Hà Nội	1925	Heavy industry	Destruction	Energy
29	Simca Auto Garage	Garage ô tô Simca	Hà Nội	1927	Light industry	Destruction	Car repair
30	Bien Hoa Water Treatment Plant	Nhà máy nước Biên Hoà	TPHCM	1930	Heavy industry	Currently operating	Water supply
31	Da Lat Train Station	Ga Đà Lạt	Lâm Đồng	1932	Infrastructure	Cease operations	Traffic
32	Cu Gioanh Textile Factory	Nhà máy dệt Cự Gioanh	Hà Nội	1939	Light industry	Destruction	Textiles
33	Ankroet Hydroelectric Power Plant	Thủy điện Ankroet	Lâm Đồng	1942	Infrastructure	Currently operating	Energy
34	Central Pharmaceutical Factory No. 1	Nhà máy dược phẩm trung ương số 1	Hà Nội	1945	Light industry	Change of function	Pharmaceuticals
35	Tien Bo Printing Factory	Nhà máy In Tiến Bộ	Hà Nội	1946	Light industry	Destruction	Printing
36	Garment Factory No. 10	Nhà máy May 10	Hà Nội	1946	Light industry	Currently operating	Textiles
37	Lao Cai Apatite Plant	Nhà máy Apatit Lào Cai	Lào Cai	1955	Heavy industry	Currently operating	Ore processing
38	Thong Nhat Match Factory	Nhà máy Diêm Thống Nhất	Hà Nội	1956	Light industry	Currently operating	Matches
39	Thang Long Tobacco Factory	Nhà máy thuốc lá Thăng Long	Hà Nội	1957	Light industry	Cease operations	Cigarette
40	Thuong Dinh Shoe Factory	Nhà máy giày Thượng Đình	Hà Nội	1957	Light industry	Currently operating	Shoes
41	Tran Hung Dao Mechanical Factory	Nhà máy cơ khí Trần Hưng Đạo	Hà Nội	1957	Light industry	Destruction	Machinery manufacturing
42	Hanoi Mechanical Factory	Nhà máy cơ khí Hà nội	Hà Nội	1958	Light industry	Currently operating	Machinery manufacturing
43	Thang Long Garment Factory	Nhà máy may Thăng Long	Hà Nội	1958	Light industry	Destruction	Textiles
44	Rang Dong Light Bulb and Thermos Factory	Nhà máy bóng đèn và phích nước Rạng Đông	Hà Nội	1958	Light industry	Currently operating	Light bulb, thermos flask
45	8/3 Textile Factory	Nhà máy dệt 8/3	Hà Nội	1958	Light industry	Destruction	Textiles
46	Van Diem Sugar Factory	Nhà máy Đường Vạn Điểm	Hà Nội	1958	Light industry	Currently operating	Sugar, sugarcane
47	Van Diem Paper Mill	Nhà máy Giấy Vạn Điểm	Hà Nội	1958	Light industry	Currently operating	Paper
48	Bac Hung Hai Canal	Kênh Bắc Hưng Hải	Hà Nội- Hưng Yên- Hải Dương	1958	Infrastructure	Currently operating	Irrigation
49	Dong Xuan Knitting Factory	Nhà máy dệt kim Đông Xuân	Hà Nội	1959	Light industry	Cease operations	Textiles
50	Hanoi Rubber Factory	Nhà máy cao su Hà nội	Hà Nội	1959	Light industry	Cease operations	Rubber

51	Hanoi Paint Chemical Factory	Nhà máy hoá chất sơn Hà nội	Hà Nội	1959	Light industry	Currently operating	Paint
52	Hong Ha Stationery Factory	Nhà máy văn phòng phẩm Hồng Hà	Hà Nội	1959	Light industry	Destruction	Stationery
53	Cau Duong Wood Factory	Nhà máy gỗ Cầu Đuống	Hà Nội	1959	Light industry	Currently operating	Wood products
54	19/5 Textile Factory	Nhà máy Dệt 19/5	Hà Nội	1959	Light industry	Cease operations	Textiles
55	Thach Ban Brick Factory	Nhà máy gạch Thạch Bàn	Hà Nội	1959	Light industry	Change of function	Building materials
56	Tu Liem Brick Factory	Nhà máy gạch Từ Liêm	Hà Nội	1959	Light industry	Destruction	Building materials
57	Thai Nguyen Iron and Steel Complex	Khu gang thép Thái Nguyên	Thái Nguyên	1959	Heavy industry	Currently operating	Iron and steel
58	Viet Tri Chemical Plant	Nhà máy hoá chất Việt trì	Phú Thọ	1959	Heavy industry	Currently operating	Chemicals
59	Thang Loi Textile Factory	Nhà máy Dệt Thắng Lợi	TPHCM	1959	Light industry	Cease operations	Textiles
60	Cogido Paper Mill	Nhà máy giấy Cogido	Đồng Nai	1959	Light industry	Cease operations	Paper
61	Hanoi Soap Factory	Nhà máy xà phòng Hà Nội	Hà Nội	1960	Light industry	Cease operations	Soap, chemicals
62	Hai Ha Confectionery Factory	Nhà máy bánh kẹo Hải Hà	Hà Nội	1960	Light industry	Currently operating	Confectionery
63	Sao Vang Rubber Factory	Nhà máy cao su Sao Vàng	Hà Nội	1960	Light industry	Cease operations	Rubber
64	Mai Dong Mechanical Factory	Nhà máy cơ khí Mai Động	Hà Nội	1960	Light industry	Currently operating	Mechanical tools
65	Minh Khai Textile Factory	Nhà máy dệt Minh Khai	Hà Nội	1960	Light industry	Cease operations	Textiles
66	Van Dien Fertilizer Factory	Nhà máy Phân bón Văn Điển	Hà Nội	1960	Light industry	Currently operating	Fertilizer
67	Hanoi Battery Factory	Nhà máy Pin Hà nội	Hà Nội	1960	Heavy industry	Currently operating	Batteries
68	Winter Textile Factory	Nhà máy Dệt Mùa Đông	Hà Nội	1960	Light industry	Destruction	Textiles
69	Thong Nhat Bicycle Factory	Nhà máy xe đạp Thống Nhất	Hà nội	1960	Light industry	Change of function	Bicycle
70	Viet Thang Textile Factory	Nhà máy Dệt Việt Thắng	TPHCM	1960	Light industry	Currently operating	Textiles
71	Chem Concrete Factory	Nhà máy Bê tông Chèm	Hà Nội	1961	Heavy industry	Currently operating	Building materials
72	Uong Bi Thermal Power Plant	Nhà máy Nhiệt điện Uông Bí	Quảng Ninh	1961	Heavy industry	Currently operating	Energy
73	Da Nhim Hydroelectric Power Plant	Nhà máy thủy điện Đa Nhim	Ninh Thuận	1961	Heavy industry	Currently operating	Energy
74	Dalat Nuclear Research Reactor	Lò phản ứng Hạt nhân Đà Lạt	Đà Lạt	1962	Energy	Currently operating	Energy
75	Da Lat Nuclear Reactor	Nhà máy Dệt may Hoà Thọ	Đà Nẵng	1962	Infrastructure	Currently operating	Energy
76	Hoa Tho Textile Factory	Thủy điện Thác Bà	Yên Bái	1963	Light industry	Currently operating	Textiles
77	Thac Ba Hydroelectric Power Plant	Nhà máy Dệt Phong Phú	TPHCM	1964	Infrastructure	Currently operating	Energy

78	Phong Phu Textile Factory	Nhà máy Xi măng Hà Tiên	Kiên Giang	1964	Light industry	Currently operating	Textiles
79	Ha Tien Cement Factory	Nhà máy tấm Eternit Biên Hoà	Đồng Nai	1964	Heavy industry	Currently operating	Building materials
80	Bien Hoa Eternite Sheet Factory	Nhà máy Bánh kẹo Hải Châu	Hà Nội	1965	Light industry	Cease operations	Building materials
81	Hai Chau Confectionery Factory	Nhà máy Nhiệt điện Thủ Đức	TPHCM	1965	Light industry	Currently operating	Confectionery
82	Thu Duc Thermal Power Plant	Nhà máy nước Thủ Đức	TPHCM	1966	Heavy industry	Currently operating	Energy
83	Thu Duc Water Treatment Plant	Nhà máy công cụ cắt gọt số 1	Hà Nội	1968	Infrastructure	Currently operating	Water supply
84	Cutting Tool Factory No. 1	Nhà máy Sơn tổng hợp Hà nội	Hà Nội	1970	Light industry	Cease operations	Mechanical tools
85	Hanoi General Paint Factory	Nhà máy khoá Minh Khai	Hà Nội	1972	Light industry	Currently operating	Paint
86	Minh Khai Lock Factory	Hồ Núi Cốc	Thái Nguyên	1972	Light industry	Currently operating	Locks of all kinds
87	Nui Coc Lake	Nhà máy Dệt 10/10	Hà Nội	1973	Infrastructure	Currently operating	Irrigation
88	Textile Factory 10/10	Nhà máy bê tông đúc sẵn Thịnh Liệt	Hà Nội	1977	Light industry	Currently operating	Textiles
89	Thinh Liet Precast Concrete Factory	Thủy điện Hòa Bình	Hòa Bình	1979	Heavy industry	Currently operating	Building materials
90	Hoa Binh Hydroelectric Power Plant	Nhà máy Nhiệt điện Phả lại	Hưng Yên	1980	Infrastructure	Currently operating	Energy
91	Pha Lai Thermal Power Plant	Hồ Tuyền Lâm	Lâm Đồng	1982	Heavy industry	Currently operating	Energy
92	Tuyen Lam Lake	Nhà máy Giấy Bãi Bằng	Phú Thọ	1982	Infrastructure	Currently operating	Irrigation
93	Bai Bang Paper Mill	Nhà máy cơ điện Trần Phú	Hà Nội	1984	Light industry	Currently operating	Stationery
94	Tran Phu Electromechanical Factory	Nhà máy Thuỷ điện Trị An	Đồng Nai	1984	Light industry	Currently operating	Electrical cable

Cambodia

N°	Name of the property	Location	Year of establishment	Typology of industry	State of Conservation
14th Century: Pre-Angkor and Angkor Period					
1	Hydraulic system of Angkor	Angkor National Park	8th century CE	Infrastructure - Water	Worl Heritage UNESCO Registration (1992)
2	Stone Mine during Angkor	Kulen mountain, Bonreaymeanchhey	8th century CE	Mining - Stone	Yes
1863-1953: French Protectorate					
3	Tuol Songkae Power Station (oil-fired)	Tuol Songkae, Phnom Penh	1900s	Infrastructure - Electricity	Unprotected
4	Water Supply	Chroy Chongva, Phnom Penh	1900s	Infrastructure - Water	Unprotected
5	Railway network and Staions	Regional	1930s	Infrastructure - Railways	Unprotected

5	Railway network and Staions	Regional	1930s	Infrastructure - Railways	Unprotected
6	Enthanu Bridge	Kampot province	1940s	Infrastructure - Roads	National protection
7	Pochentong Airport	Phnom Penh	1940s	Infrastructure - Aviation	Unprotected
8	Central Market	Phnom Penh	1930s	Commercial - Public Market	National protection
9	Psar Trey	Kampot province	1930s	Commercial - Public Market	National protection
10	Psar Nat (Battambang Market)	Battambang province	1937	Commercial - Public Market	National protection
1953-1975: Sangkum Reastr Niyum (Independent period)					
11	Cement Factory	Kampot	1960s	Cements	Unprotected
12	Sihanouk Ville Port	Sihanouk Ville	1960s	Infrastructure - Port	Unprotected
13	Usine Textile de Kompong Cham	Kampong Cham		Textiles	Unprotected
14	Glass Factory	Cherng Ek Phnom Penh	1966	Glass	Unprotected
15	Factory Phnom Penh (Rubber Industies)	ChakAngre, Phnom Penh		Forest Industries - Rubber	Unprotected
16	Asia Flour Mill Corporation	Pnom Penh		Food Processing - Flour	Unprotected
17	Camboida Beverage- Cocacola factory	Ruessey Keo, Phnom Penh	1960s	Food Processing - Drinks	Unprotected
18	Cenima in Phnom Penh	Pnom Penh	1960s	Indistrial Communities	Unprotected
19	Chhlong Paper factory	Kratie		Paper	Unprotected
20	White whisky factory	Reussey Keo, Phnom Penh	1960s	Food Processing - Liquour	Unprotected
1975-1979: Khmer Rouge					
21	Kampingpuoy water dam	Battambang	1975-1979	Infrastructure - Water	Unprotected
1979- Today					
22	Tuol Kok TV Antenna,	Tuolkok, Phnom Penh	c1966	Telecommunications	Unprotected

ANNEX 2

Contributors' Biographies

Pauline Basilia
Research Fellow,
Far Eastern University, Manila
Professorial Lecturer, University of the Philippines Diliman

Pauline Basilia is a practicing archaeologist and paleontologist. She earned her Master's degree in Archaeology from the University of the Philippines Diliman and completed her PhD at Griffith University in Queensland, Australia. Her archaeological research focuses on the emergence of industrial commerce in the Philippines during the late colonial period. In paleontology, her work centres on the paleobiology of extinct elephants and their relatives. She collaborates with both local and international institutions, including the National Museum of Natural History and the University of the Philippines School of Archaeology, as well as the Naturalis Biodiversity Center in Leiden, The Netherlands, and the Bandung Geological Museum in Java, Indonesia.

Gabriel Caballero
Director, CALAHE Environmental Consultancy Services
Former Focal Point, ICOMOS Sustainable Development Goals Working Group

Gabriel Victor Caballero is a heritage specialist and landscape architect with extensive experience in cultural heritage conservation, cultural landscapes, and World Heritage processes. He is the Director and Principal Consultant of CALAHE Environmental Consultancy Services, where he leads heritage projects and initiatives linking culture with the implementation of the Sustainable Development Goals. His work spans research, documentation, and advisory services for heritage sites, including nomination dossiers, management and conservation frameworks, material conservation advisory work, and cultural landscape site management. Gabriel's professional interests include the conservation of diverse forms of heritage, heritage policy and governance, and the integration of heritage values into development planning. He is actively engaged in capacity-building, research, and professional exchange across the Asia-Pacific region.

Supradith Chitagon
Assistant Professor, Rangsit University

Supradith Chitagon is an Assistant Professor in the Faculty of Architecture at Rangsit University. His doctoral research focused on the identification and valuation of industrial heritage in Thailand. His broader research interests include cultural landscapes and architectural design. Dr.Supradith serves as the lead investigator for the cultural heritage assessment in Chaiya, Surat Thani, and is currently engaged in community-based and value-based assessments within the heritage buffer zones of the Si Thep Ancient Town UNESCO World Heritage Site.

Parinya Chukaew
Associate Professor, King Mongkut's Institute of Technology Ladkrabang

Parinya Chukaew is an Associate Professor at the School of Architecture, Art, and Design, King Mongkut's Institute of Technology Ladkrabang. Since 2010, he has been working closely with the historic preservation network, local government agencies, scholars, private sectors, and the local people on various historic preservation projects in Thailand. His role in historic preservation is to survey, identify, document, and create reference documents for stakeholders in the fields of urban planning, community and social development. His works would also provide local residents with information to maintain the community's identity, and have pride for the community's future.

Malen Chung
Freelance Architect

Malen Chung holds a PhD in Architecture and Urban Heritage Conservation from the Architecture Research Laboratory at the National School of Architecture of Toulouse, France. Her doctoral research focused on large-scale preservation of the Sangker River landscape in Battambang, Cambodia. Since 2017, she has lectured in Architectural Science, Architectural Design Studios, and Architecture Conservation in Cambodia. She earned a Bachelor of Architecture and Urbanism from the Royal University of Fine Arts (2016) and a Master of Science in Building Technology from Universiti Sains Malaysia. Alongside freelance architectural work, she serves as an urban planning consultant and leads a team specializing in Green Building Certification and sustainable urban development.

Eugene Raymond P. Crudo
Assistant Professor, University of the Philippines Los Baños
Director of the Business Affairs Office and Assistant Vice Chancellor at the Office of the Vice Chancellor Administration, University of the Philippines Los Baños

Eugene Raymond P. Crudo is an Assistant Professor at the Department of Social Sciences, College of Arts and Sciences, University of the Philippines Los Baños. He finished his undergraduate degree in B.F.A. in Industrial Design and his Master's degree in History at the University of the Philippines-Diliman. His research interests include local history, cultural heritage, classical sculpture, entrepreneurship and industrial design. He is a co-author of Rex modules on Rizal and NSTP 1 & 2. He serves as the current Director of the Business Affairs Office and Assistant Vice Chancellor at the Office of the Vice Chancellor Administration at UPLB. He is also a current Board of Trustees of the Heritage Conservation Society.

Richard A. Engelhardt, Jr.
UNESCO Senior Advisor for Culture and World Heritage Mentor

Richard A. Engelhardt, Jr. has been a leader in cultural heritage research and conservation efforts throughout Asia for the past four decades, teaching at universities throughout the Asia-Pacific region and serving in senior leadership positions with UNESCO. In 1991, he established the UNESCO Office in post-conflict Cambodia and initiated the International Safeguarding Campaign for Angkor. From 1994-2008, he served as UNESCO Regional Advisor for Culture in Asia and the Pacific, and subsequently as UNESCO Senior Advisor for Culture and World Heritage Mentor. During his UNESCO service, Engelhardt initiated the UNESCO Heritage Awards for Cultural Heritage Conservation in Asia; established the UNESCO-ICCROM Asian Academy for Heritage Management; and spearheaded the effort to implement heritage impact assessment for the safeguarding of cultural heritage sites throughout Asia.

Dominic Q. Galicia
Expert Member, ICOMOS ISC20C
Principal Architect, Dominic Galicia Architects

Dominic Galicia is the Principal Architect of Dominic Galicia Architects, known for its design sensitivity to concept and detail. He earned his architecture degree in 1988 from the University of Notre Dame, where he was a Notre Dame Scholar, and pursued graduate studies at Pratt Institute. A modernist at heart, Galicia is dedicated to preserving historic architecture. He has held leadership roles as President of ICOMOS Philippines and Vice President of the Heritage Conservation Society. He serves on the Executive Council of the National Committee on Monuments and Sites and the Board of Trustees of the PGBI, and represents the Philippines in the International Scientific Committee on 20th Century Heritage.

Ivan Anthony Henares
President, TICCIH Philippines
Associate Professor, University of the Philippines Diliman

Ivan Anthony Henares, PhD is a tourism educator, cultural policy researcher, and heritage advocate. He is Secretary-General of the UNESCO National Commission of the Philippines, Commissioner of the National Commission for Culture and the Arts (NCCA), and Assistant Professor at the University of the Philippines Asian Institute of Tourism. He is President of the ICOMOS International Cultural Tourism Committee, Chairperson of the Southeast Asian Cultural Heritage Alliance, Chairperson of the Heritage Conservation Society, Head of the Subcommissions on Cultural Heritage and National Committee on Monuments and Sites of the NCCA, and Committee President of TICCIH Philippines. He was named one of The Outstanding Young Men (TOYM) in the field of Heritage Conservation in 2012, and an Asia 21 Young Leader in 2008.

Adian Han
Conservation Consultant, Studio Lapis

Adrian Han is a graduate of the National University of Singapore. He practices as a conservation consultant at architectural conservation consultancy Studio Lapis and is a teaching and research associate at his alma mater. His interest lies at the intersection of architectural research, pedagogy, design, and adaptive reuse.

Weng Hin Ho
Vice President, ISC20C
Founding Partner, Studio Lapis

Ho Weng Hin is co-founder of Studio Lapis, an award-winning architectural conservation specialist consultancy based in Singapore. An ardent heritage advocate, he is founding Chair of Docomomo Singapore, founding Director of ICOMOS Singapore, and currently Vice President of ICOMOS International Scientific Committee on 20th Century Heritage. Weng Hin is Adjunct Associate Professor at the NUS Architecture and is a core instructor for the Getty's International Course on Conservation of Modern Heritage. Trained as an architect, he obtained his specialist postgraduate diploma in architectural conservation from the University of Genoa, Italy. He has lectured and published extensively on heritage conservation locally and internationally.

Truong Ngoc Lan
Architect, 1+1>2 Architects

Truong Ngoc Lan is an architect, university lecturer, researcher on the history of architecture and architectural heritage of Vietnam. He is also a member of Docomomo Vietnam. He received his PhD in architecture from the Hà Noi University of Civil Engineering and currently teaches at the Department of Architectural Theory and History, Faculty of Architecture and Planning, Hanoi University of Civil Engineering. At the same time, Mr. Truong Ngoc Lan is a practicing architect at 1+1>2 Architects in Hanoi.

Leedom Lefferts
Professor Emeritus, Drew University

Dr. Leedom Lefferts is Professor Emeritus of Anthropology at Drew University and a former Research Associate in the Department of Anthropology at the Smithsonian Institution. His research broadly focuses on social organisation, Southeast Asian anthropology, with and emphasis on textiles and ceramics, as well as Buddhism. His geographical foci are Thailand and Lao DPR.

Lim Take Bane
Design Principal, Arkitek Shilpa

Ar. Lim Take Bane, a Kuala Lumpur native, trained as an architect in London, United Kingdom. He is a chartered architect (UK, 1983), a member of the Royal Institute of British Architects, and a Fellow of the Malaysian Institute of Architects (2010). Beyond designing modern edifices, he strongly advocates architectural heritage conservation to create cities with a genuine sense of place. He founded his firm ARKITEK SHILPA in 1989 and has taught at the University of Malaya, where he coordinated heritage documentation studios (2005–2014).

Rungsima Kullapat
Researcher, Carolina Asia Center, University of North Carolina

Dr. Rungsima Kullapat is a researcher at the Carolina Asia Center, University of North Carolina at Chapel Hill. She is the director of the project to revitalize tin-mining industrial heritage across the Andaman region of Thailand, Malaysia, and Indonesia. With more than twenty years of experience in cultural heritage work, she specializes in old-town revitalization using inclusive-growth approaches and community participation. She is the founder of the Phimai Heritage Trust, the Nakhon Ratchasima Heritage Trust, and the Ranong Heritage Trust, all of which focus on community-led urban heritage conservation for long-term sustainability.

Giacomo Martinis
Consultant, CALAHE Environmental Consultancy Services

Giacomo Martinis is an architect, project manager, and heritage professional. Trained as an architectural historian at University College London, he holds a Joint MSc in Architectural Conservation from ENSA Paris-Val de Seine and the University of Venice. While his earlier career focused on the conservation and adaptive reuse of historic buildings, Giacomo worked in particular within UNESCO's Culture Sector. He first served in the Secretariat of the 1972 World Heritage Convention and later as an Individual Specialist for the World Heritage Centre and UNESCO Regional Offices. His current work focuses on cultural development and World Heritage initiatives, ranging from project design and implementation to their evaluation.

Amarit Muadthong
Assistant Professor, Mahasarakham University

Amarit Muadthong is an Assistant Professor of Architecture at Mahasarakham University. His doctoral research focuses on the salt rock formations of Northeastern Thailand and the cultural landscapes of salt-producing regions within the Mekong Basin. His research expertise encompasses "saltscape" heritage, regional ecclesiastical architecture, and the intersection of ethnic settlements and sustainable development. He is dedicated to exploring how cultural foundations support resilient livelihoods and environmental preservation in South-East Asia.

Miles Oglethorpe
The International Committee for the Conservation of the Industrial Heritage (TICCIH)

President of TICCIH between 2018 and 2025, and Board member since 2003. Retired from the national heritage organisation, Historic Scotland in 2024 after 39 years' service. Graduated with PhD at Glasgow University, commencing work on industrial heritage as a research fellow at Strathclyde University in 1983. Led the team that successfully nominated The Forth Bridge for World Heritage listing in 2015, and continues to work

with international partners on industrial heritage in Japan, Norway, Poland and the Middle East. Specialised in the history of coal mining and also helped found the project 'Capturing the Energy' in 2005, which works to secure the history of the United Kingdom of Great Britain and Northern Ireland's offshore oil and gas industries. Continues to work on World Heritage issues, and advises ICOMOS. Teaches for the postgraduate conservation course at the University of Edinburgh.

Pham Thuy Loan
Chairperson, Docomomo Vietnam

Pham Thuy Loan is a Vietnamese architect and urban planning expert specializing in industrial heritage preservation and adaptive reuse of modern architecture. She holds a degree in architecture from Hanoi University of Civil Engineering and earned her Master's and Doctorate in Urban Engineering and Design from Tokyo University, Japan. From 2014 to 2020, she was Vice Director of the Vietnam Institute of Architecture, leading research on modern architecture and industrial sites while advocating for heritage conservation. She is interim Chairwoman of Docomomo Vietnam and Vietnam correspondent for the Asian Network of Industrial Heritage, mentoring young architects in sustainable preservation practices.

Timothy Augustus Y. Ong
Member, TICCIH Philippines
Member, Heritage Conservation Society of the Philippines

Timothy Augustus Y. Ong is an architect and cultural heritage worker focusing on the documentation and conservation of the built environment in hot and humid climates. His research and practice explore the intricacies of tropicality and architecture, including their underlying power dynamics and colonial underpinnings. He has worked on Philippine cultural landmarks, including the Manila Metropolitan Theater and Rizal Memorial Coliseum. In 2023, he obtained an Erasmus Mundus joint master's degree in architecture, landscape, and archaeology and was the 2023–24 graduate intern for the Getty Conservation Institute's Conserving Modern Architecture Initiative.

Gerald P. Regalado
Freelance Photographer and Layout Artist

Gerald "Wang" Regalado is a photographer and creative layout artist who has worked with the Provincial Government of Albay since 2012. In 2024, he was commissioned to design the graphics for the World Heritage Nomination Dossier of the Mayon Volcano Cultural Landscape. He has also done the creative design for the Albay Biosphere Reserve Management Plan in the same year. Wang is working with CALAHE Environmental Consultancy Services as a graphic designer for the UNESCO-TICCIH publication of the Industrial Heritage in South-East Asia.

Maya Rosa
Architect, Lecturer and Researcher
ICOMOS Indonesia

Dr. Ar. Maya Rosa, M.Arch., is an architect and interior designer with international project experience, as well as a lecturer and independent researcher based in Bandung, Indonesia. She serves at the Faculty of Design, Universitas Santo Borromeus, Bandung, and as Treasurer of ICOMOS Indonesia. Her research focuses on cultural heritage conservation, with particular emphasis on intangible heritage, cultural landscapes, and industrial heritage. She views heritage as a dynamic and evolving process embedded in everyday life. Her work

bridges design practice and heritage discourse, contributing to broader scholarly discussions on sustainability and the future of heritage in changing global contexts.

Leeung Sakona
Architect and Researcher

Loeung Sakona is a Cambodian architect and researcher specializing in architectural design, modern South-East Asian architecture, and urban development. He holds a Master's Degree in Architecture from Chiang Mai University, Thailand, and a Bachelor's Degree in Architecture and Urbanism from the Royal University of Fine Arts, Cambodia. His research interests include modern Khmer architecture and urban transformation, and he has contributed to the mASEANa Project (Modern ASEAN Architecture), an international research initiative documenting modern architectural heritage in South-East Asia. He currently serves as Project Coordinator, Architect, and Technical Advisor based in Phnom Penh.

Pinai Sirikiatikul
Assistant Professor, Silpakorn University

Pinai Sirikiatikul is an Assistant Professor of Architecture at Silpakorn University. Following his doctoral studies in Architectural History at University College London (2012), he has focused his scholarship on Thailand's construction history and the conservation of its industrial and modernist heritage. He is the author of Unpacking the Archives: Amorn Srivongse, which sheds light on the neglected contributions of a lesser-known, self-taught architect. His current research seeks to bridge the gap between historical archival documentation and the practical understanding of how construction practices have shaped the architectural landscape of Thailand over the last two centuries.

Supitcha Sutthanonkul
Researcher, Southeast Asian Ministers of Education Organisation's Regional Centre for Archaeology and Fine Arts

Supitcha is a full-time researcher at the Southeast Asian Ministers of Education Organization's Regional Centre for Archaeology and Fine Arts (SEAMEO SPAFA). She holds a Bachelor of Architecture (Interior Architecture) and a Master's degree in World Heritage Studies from Brandenburg University of Technology Cottbus–Senftenberg, Germany. Since 2019, she has been actively involved in heritage-related projects and initiatives at both national and international levels. Her work has shaped her interests in World Heritage, the CultureNature nexus, and holistic approaches to heritage conservation. She focuses particularly on industrial heritage, forestry heritage, and the impacts of climate change on heritage. She also engages in climate-related initiatives, contributing to research and international forums such as the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC).

Hasti Tarekat
Founder, Heritage Hands-On

Dra. Hasti Tarekat, M.Si., is the founder of Heritage Hands-On, an organisation specializing in capacity building and the empowerment of cultural heritage movements. She is also the co-founder of the Sumatra Heritage Trust and the Pan-Sumatra Network for Heritage Conservation. She serves as Vice Chairperson of the Advisory Board of the Asian Network for Industrial Heritage (ANIH) and as the national contact person for Indonesia for The International Committee for the Conservation of the Industrial Heritage (TICCIH).

Narathip Thubthun
Associate Professor, Rajamangala University of Technology

Narathip Thubthun, is an Associate Professor in vernacular architecture at the Faculty of Engineering and Architecture, Rajamangala University of Technology Tawan-ok, Thailand. His research explores the relationships between local knowledge, vernacular engineering, modern architectural heritage, cultural landscapes, industrial heritage and living heritage systems. His fieldwork has contributed to the recognition of the Lamtakong water-lifting wheel system, which has been inscribed on Thailand's Intangible Cultural Heritage (ICH) inventory, as a significant irrigation technology and cultural landscape in South-East Asia.

Johannes Widodo
Professor, National University of Singapore, MA Architectural Conservation Programme

Dr Widodo has affiliations with the mAAN (modern Asian Architecture Network) and he is the founder & executive of AAHM (Asian Academy for Heritage Management). He is part of the executive committee of the UNESCO Asia Pacific Awards for Cultural Heritage Conservation jury and is both a member of ICOMOS Indonesia and Singapore. He is a founder of DoCoMoMo Macau and Singapore and he also founded the International Network of Tropical Architecture (INTA). He also serves as executive and founder of TCHS (The Circle for Human Sustainability). Lastly, he is a member of the South East Asian Cultural Heritage Alliance (SEACHA) which he was founder and part of its advisory board.

Jaclyn Chua Xinhua
Conservation Specialist, Studio Lapis

Jaclyn Chua Xinhua is a conservation specialist at Studio Lapis Conservation. With almost a decade of experience in heritage consultancy and research, her work spans architectural conservation, heritage planning and management, and heritage interpretation. She holds a Master of World Heritage Studies (BTU Cottbus-Senftenberg) and a Master of Cultural Heritage and Museum Studies (Deakin University), focusing on living heritage and ethnographies of historic cities. A member of ICOMOS Singapore, she has spoken on heritage management and conservation in public and professional forums.

The Industrial Heritage of South-East Asia

A Thematic Regional Study



unesco

In collaboration with

TICCIH

ISC 20C International Scientific Committee on 20th Century Heritage