

博 士 論 文

Study on the Evolution of a Heritage Tin Mining Town: A Case of Taiping in Perak, Malaysia

(錫鉱山町の遺産としての展開に関する研究 - マレーシア・ペラ
州タイピンを対象として)

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ABSTARCT

Since 1997, UNESCO had recognised the industrial heritage site, monuments and properties to include the mining landscapes or mining regions as world heritage site (Fleming, 2012). There are 60 protected industrial sites affirmed by UNESCO World Heritage Centre and 24 sites are nominated as the world heritage mining industry. In Malaysia, the tin mining industry is the pioneer economic sector and it became the principal economic generator to Malaya States in mid-19th century. The demands of industrial raw material from the western country accelerate the tin trades in Malay Peninsula whereby many boom tin towns had constructed regulated by the British colonial. Hereof, the British colonialism began in Perak State encroached to the first Larut Wars by ratified Pangkor Treaty Agreement in 1874s. Subsequently, British colonist had to oversee the Malay States political power and tin economic by introducing the 'Residency System' (British advisory) and Federated Malay States (FMS) to authorise the 'tin states'. British had taken over the Malayan tin States embraces the Selangor (Kuala Lumpur), Negeri Sembilan, Pahang (Sungai Lembing) and Perak. Meantime, the first tin mining town had gazetted by British namely Taiping purported as the town of eternal peaceful. The first tin ore found in Klian Pauh, Larut district (the 1840s) by a Malay Chieftain, Long Jaafar. Besides Larut, another Kinta Valley districts are the tribute of rich tin producer after Taiping tin exhausted. Both Larut and Kinta district are the principle tin producers in between 19th to 20th centuries. The two tin fields positioned on the longest and affluent tin belt laid on the west coast of Malaysia. During the British colonial period, the impacts of tin industrialisation caused to the promptly economic growth, small tin town urbanisation, demographic changed, and the expansion of infrastructure and facilities.

Hitherto, the tin booms had accelerated Perak to become the thriving and well-developed state in Malaysia. Many tin traders are the Chinese merchant from Strait Settlement and European entrepreneur flocked into Perak and other tin states. In the early Larut tin rush era, many Chinese immigrant labours or 'coolies' recruited by the Chinese Kongsis (company) through the contact system. The open-pit mining method or known as 'Chinese Lombong' operated by Chinese tin workers to excavate the mining ground by using the hoe. At the beginning of tin mining operation, the manpower subjugated almost eighty percent of the tin production fees. However, the tin mining method evolutions gradually replaced by the hydraulic water jet and gravel pumps until the European corporate introduced tin dredge (in 1930) yet to increase mass tin production with less depend on labour-intensive. Essentially, tin mining industry manifested the beginning of urbanisation and modernity in the

Malay States. The important tin mining towns centre such as Taiping, Ipoh, and Kuala Lumpur are not ordinarily functioned as a tin settlement but also a melting-pot for the plural tin society to interaction and structure the tin mining town. Apparently, British colonial adopted the western urban planning into a Malayan mining town. The tin mining town implications in Malaysia entails of distinctive colonial townscapes and the plural society characters. The tin mining town assimilates in the 'Grand Modell' (in 1670) colonial town planning initiated the similar grid-iron pattern, public square, wide street (thoroughfares), reserved open space, standard-sized and rectangular plots.

However, through the literature studies and site survey which had identified the issues of the landscape changed when the continuous phenomenon raised by natural processes or human activities stated in Antrop (2008). The landscape alteration could bring either positive development or the divergence deterioration. Therefore, the remnants of post-industrial mining landscapes in Malaysia remained the undulating open ground, sand tailing, open cuts, sand beds and also mining ponds. Further, the landscape modification in Taiping case study caused by the rapid urbanisation had destroyed the tangible relics such as heritage building, monuments and historic landscape. Undeniably, the heritage conservation on tin mining town and industrial heritage is a challenging task for the safeguarding. Through the theoretical gap verification, mining landscape is not categorised as Malaysia's cultural landscape and the ex-mining site is the lack of integrity mention by Radziah Ahmad (2013). Nonetheless, the former tin mining town is the concrete evidence to proven the past industrial heritage and the historical attributes. Therefore, the research aim is to determine the evolutionary mining town and the industrial landscape transformation over the time. Additionally, this study is to examine the physical and social heritage transformation by validates the interface of tin industrial development, land use mechanism, urban morphological pattern, historical townscape, plural society composition influential to the tin mining town.

This research is conducted through a case study and supported by the discussion of the comparative tin mining town in Malaysia. Inasmuch, Taiping is selected as the primary case study because (i) the first Tin Township planned by British, (ii) colonial heritage townscape, (iii) the first railroad built in Taiping-Port Weld and (iv) multi-cultural heritage values. The qualitative research method is conducted to investigate the physical spatial and social transformation of Taiping by conducting the literature studies to rationalise research gap and refine research problem. The primary and secondary data were syntheses to justify the key attributes and Malaysia tin mining town characters. This study also included the case of Kinta Valley tin district (including Ipoh, Gopeng, Papan, Kampar, Pusing, Batu Gajah and Tronoh) and Sungai Lembing underground mining in Kuantan Pahang. In this research, The

justification of the significance and differences mining town characters entailed of the most productive mining town (Kinta Valley district), the Eastern Range of underground mining town (Sungai Lembing), and the 'many firsts' heritage mining town (Taiping). Then, all the output data analysed through the descriptive content analysis, mapping and illustration model.

Succinctly, the finding revealed Malaysia mining town transformation began from an ephemeral mining camp turned into a permanent tin township. The ex-tin mining town characters was identified through the indication factors of (i) geographical setting and historical background (location of the tin belt), (ii) British colonial influences, (iii) socio-economic entities and (iv) multi-ethnic compositions. Herein, the physical and social factor vindicate the typologies of tin mining town in Malaysia are based on the similarity and divergence characters of each tin mining town predominantly in different mining town spatial pattern, topography location (valley, river and highland), the colonial townscape and historical elements. Hence, the subdivision of typologies of tin mining town in Malaysia are the: (a) Tin town built in between river; (b) Tin mining town attached to a hill station; (c) the tin town British residency built on the higher ground; and (d) The development of tin mining town centre disparity to typical mining town. Besides the aforementioned, the tin industrial infrastructure such as the giant water pipelines in Gopeng, Batu Gajah tin dredge and the longest tunnel of Sungai Lembing mine constituted to the historical townscape of Malaysia mining town.

Come across to Taiping tin mining town, the finding has proven the unique characteristic determined by actual possession and the colonial town planning to distinguish from another mining town. Taiping situated on Larut plains underwent landuse changed successions from the existing natural landscape turned into a tin township. Three main zones had built up Taiping tin town congruent with Highland (hill station), the lowland (British administration and Parkland), and the Chinese town (commercial area). Wherein, the spatial pattern of Taiping Township demarcated the separated settlement in between the British colonial quarter and Chinese town indicated by the hidden border of widening street and the large green Lake Gardens. The urban morphology revealed Taiping has driven into rapid development where the first railroad and ancillary social infrastructure have built. Besides, the growth of plural society is clearly seen where the multi-ethnic settlement and social spaces (Little India, the traditional laundry service: Dhoby line and marketplace) formation in Taiping downtown. Especially, the clan association and religious building epitomise the diversity cultural and variance background of each tin society. In comparison to Kinta Valley and Sungai Lembing tin mining towns, Taiping has the proper drainage system to control rainfalls, large green parkland, and the hill station that emphasised 'dual European quarters' built in the same mining town. Therefore, the lake pond diverts the water from Taiping Lake

Garden and pass to the town centre. In other words, the Taiping townscape combination of the natural landscape, colonial town planning, and tin infrastructures designated a pleasant and cleanliness living mining town.

The tangible and intangible heritage again to elucidate Taiping the western colonial and eastern cultural cohesion interpreted into Taiping townscapes. Whereas, the historic townscape in Taiping manifested by the heritage building, grid-iron street pattern, natural feature, and the social spaces to increase the visual and accessibility legibility. For example, the Taiping Lake Garden and Larut Hill is the vital natural landmark to indicate Taiping's location. Alternatively, Taiping Clock tower defined as the visual cue in the position of centre downtown. The formal gridiron street pattern and the short distance old shophouses building blocks (accumulated of ten unit shophouses) proliferate the visual permeability and the accessibility in the heritage tin mining town. The building activities and active building frontage hitherto to improve the visual distinctness of Taiping town such like the Goldsmith shops and pawn shops were found at Pasar Road; whereas the furniture shops mainly concentrated at Kota Road. Seemingly, the distinctive historic townscape in Taiping gave a good sensory for walkability and visual indications.

On the other hand, the research finding denoted Taiping Municipal Council mainly focuses on the built heritage conservation stated in the phasing development plan (2008 to 2020). Through the research finding, the implication of Taiping heritage is shaped by the post-colonial heritage, industrial heritage and mining cultural landscape attributes. Therefore the physical heritage and social entities enormously presented the characteristics of Taiping or other mining town in Malaysia. However, the important to remain the heritage identity of Taiping town by suggesting the modification of heritage core zone, regional mining landscape conservation, to preserve the linear industrial landscape (railroad), to preserve the historical, social spaces and heritage townscapes. Certainly, the meaning of Taiping mining town and its industrial heritage characters which are opposition to other World Heritage mining industrial regions. It is because the inadequate physical indication to assess the other industrial, cultural properties in Malaysia where the coolies' lines, tin furnaces (smelting house), the first railroad routes, and the ex-mining site had gone and lack of integrity. In all, this research certifies the ex- mining town in the vitality heritage property to be conserved and protected for future generation. The urban history of Taiping Township remarkable the significant heritage of tin mining town retains the heritage relics of tin industrial heritage and colonial townscape that upkeep from destroyed.

Keywords: *Tin mining town, industrial landscape, evolution, industrial heritage, colonial, cultural heritage.*

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CHAPTER 1

INTRODUCTION

1.0 Research Background

Industrial revolutions began in the 1840s first in Great Britain and other Western Europe with the new technologies, new labour working system, new water power manufacturing process, new industrial building, and the industrial settlement was developed (Cossons, 2012). The remaining industrial heritage is being the importance asset to resemble the history of past industrial and cultural heritage values. Tin mining industry began operated in Malay Peninsula or British Malaya since the 1820s. In the 19th century, this oldest industry had brought Malaya into the fast growth socio-economic thriving (JPBD, 2010). The richest alluvial tins circa 400km long and 60km wide tin belt plains laid at George Town, Melaka and the western coastal of Peninsular Malaysia (JPBD, 2010). Thus, many small towns and port cities were built during the heydays of tin industrialisation. Thereafter, the Federated Malay States (FMS) was established by British colony in 1895s to govern and control local political, economic possession and tin trading. FMS comprised of the affluent tin mining towns which are the Perak State (e.g.: Ipoh, Kampar, Gopeng, etc.), Negeri Sembilan, Selangor (Kuala Lumpur) and Pahang (Sungai Lembing). Larut was the major tin exporter when the world's demand for tin increased because of the tin canning industry and Industrial Revolution in Europe (Teoh, 2004). Thus, Malay States became one of the global raw materials suppliers and simultaneously became amplified in immigrant labour and technology (Abdullah, et.al, 2012).

Indeed, tin settlements, social infrastructure, seaport, road and railway transportation was constructed owing to tin trades and exportations. Simultaneously, the tin industry had attracted many Chinese settlers and European miners flocked to Malaya. When it comes to the 'tin rush era' in the mid-1880s, tin manufacturing and immigrant workers were promptly

increasing especially in Larut and Kinta Valley districts of Perak State (Tetsuo, 2009). The open cast mining operated extensively by the Chinese miners who are the contracted worker recruited through the truck system (Cheah, 2001). In addition, gravel pump system had persisted Chinese labourers or namely 'Chinese coolies' to produce two-third of Malayan tin ores in the 1920s. Hence, the cheap labour fees and the mining cost became the indispensable factors of why Chinese mining enterprises were dominated compared to the western company (Yip, 1969). Nevertheless, the labour-power mining method gradually substituted by European's tin dredge system in the 1930s (Jackson, 1963). The profoundly tin mining technique changed has influenced the historical economics of employment pattern and socio-livelihood in the Malay States.

In fact, tin mining industry manifested the beginning of urban modernity in the Malay States. Lees (2009) stated that the mining towns such as Taiping, Ipoh and Kuala Lumpur are the tin settlements and also a 'gateway' for multi-ethnic groups to exchange and convey the infrastructures and technologies. In other words, British imperialism on the political and economic powers had exposed and adapted the western urban plans into the Malay States. The historic cultural landscape pattern epitomized the colonial administrative buildings, open field or Esplanade (Padang), club house and commercial area (e.g.: marketplace and old shophouses). As mentioned by Harun and Jalil (2012), British colonial town plan demonstrated the building layouts rather than the land use categories. Apparently, the primary implication of mining landscape in Malaysia entails the distinctive colonial townscapes, tin town characteristic as well as the morphological industrial history. Therefore, the genuine colonial landscape could be traced either to the most British Straits Settlements or port cities (Melaka and Georgetown, Penang) and ex-mining towns. Undeniably, the heritage significance of ex-mining town became the inimitable historic town in Malaysia.

The landscape changed is a continuous phenomenon, and it had identified through the natural processes and human activities (Antrop, 2008 and Abdullah, 2011). Antrop urged that the landscape changed could bring either the development or deterioration. As far, the remnants of post-industrial mining landscapes in Malaysia remain undulating open ground, tailing, open cuts, sand beds and also mining ponds. These ex-mining lands or so-called brownfield re-use and developed into mix development, recreational area, agricultural land, conservation and initiative heritage campaign (JPBD, 2010). Besides, impacts of landscape alteration over urbanisation process have destroyed the tangible heritage inheritances (for instance building, monuments, historic landscape and so forth). The cultural heritage conservation is a challenging task, to preserve the heritage valuables mining landscape and ex-tin town.

Accordingly, this study is to identify and examine mining landscape transformation in Malaysia's tin town milieu. The research framework and analysis were conducted throughout the document analysis, case studies and fieldwork survey will be explained at the research methodology part in this chapter. Taiping is the first planned mining town possess the thirty-one of many first. Hence, the earliest planned mining town is selected as a case study to expound the evolutionary of pre and post tin industrial landscape transformation. This study concluded that mining landscape obligated for future sustainable heritage conservation.

1.2 Problem statement

Cossons (2012) states the industrial landscape was a misinterpret heritage as "urban rust belt, hazardous, a toxic wilderness". In vice versa, the heritage assets are practical for reused and regeneration to achieve cultural identity and new commercial prospect. This indication the industrial landscape shapes the intrinsic values to strengthen the sense of history and identity. Mostly, the conception of cultural landscape consists of the sense of history and heritage values could implicate in place making (Taylor and Altenburg, 2006). And yet, Stuart (2012) expresses industrial landscape had a compelling value although often indirect impact on our environment over time. According to Antrop (2005), "the landscape change might understand regards as the menace and contrary evolution that caused to the damaging of diversity, coherence and cultural landscape's identity". Antrop (1998) explains landscape change had generated by a natural process and the man activity. Thus, he clarifies how the landscape was developed and formed either by natural mechanism or the cultural modified by human activities.

On the other hand, when industrial heritage devastation in the urban and suburban area caused by the "rapid alterations in an urban expansion, land exploitation, population growth, industrial structure, technology innovation and method of production" (TICCIH, 2012 cited in Taipei declaration for Asian Industrial Heritage). That's why the process of the landscape is changing and transformation affected by the urbanisation and people misconception on industrial heritage conservation. Likewise, the case of Taiping, the physical heritage was threatened because of the rapid urban development and urban encroachment (JBPD, 2005). Through field work studies, it was identified the physical heritage deteriorations in Taiping found in changing. The adverse impacts of heritage deterioration were the degradation of old shophouses, and old government buildings (such as old rest house and railway office at Jalan Station). And eventually the most precious of first

railway lines built in the year 1855 connected Taiping and Port vanished. Indeed, such historical fabrics inherited from the industrial landscape are gradually diminishing and impacts on the significant tangible heritage and the sense of history in Taiping.

Besides the challenging part to conserve the industrial heritage and mining town, another viewpoint is the vague understanding in mining landscape conservation. In Ahmad's (2013) cultural landscape studies has pointed the Malaysia local experts (such as the Academician, National Heritage Department, National Landscape Department, and so on) in her workshop discussion are not aware of the formal mining site such as Kinta Valley and Sungai Lembing is under the process of heritage conservation. Therefore, in her research findings, former mining site is the lack of integrity that is the reason not considered it as a rural landscape in Malaysia. In fact, mining landscape or industrial heritage is regarded as a cultural landscape typology. There are many successful mining cultural sites such as Cornwall and West Devon Mining Landscape in England, and Iwami Ginzan silver mine, Japan have nominated in the world heritage list in the category of the cultural landscape and industrial heritage. In summary, the industrial heritage conservation should not only focus the site (the former mining area) but in other industrial, cultural heritage assets for instances built infrastructure, intangible heritage (like the historical event and industry society), industrial technologies, and other material which have cultural evidence.

1.3 Research Gap

The mining town and industrial landscape study are underpinning of the cultural landscape, industrial heritage (industrial archaeology), heritage conservation. The culture heritage is the fundamental conception of tin mining town and mining landscape assessment. Moreover, the remarkable the cultural and nature criteria are vitality to justify the nominated industrial mining site under UNESCO World Heritage Convention. In accordance to Cossons (2012), the importance of industrial heritage conservation which is to attain economic and social consequences. Hence, heritage protection becomes the legitimate concern by each government for every country. Indeed, Malaysia is now a developing country that had the initiatives to implement and achieve the proper heritage conservation management and regeneration approach. From the global and nation concerns about heritage conservation, subsequently to look at two potential cases of heritage conservation in Malaysia-Melaka and George Town inscribed as the historic colonial town of UNESCO World Heritage Centre in 2008. The historic cities presented both valuable tangible and intangible legacies that inherited from the multicultural heritage (cited in UNESCO, 2011).

Notwithstanding, there are numerous historical researches related to Taiping, Port Weld, and Kinta Valley and the history tin industry development in Malaysia (Wayte, 1959; Yip, 1959; Khoo, 1981, 1991, 2002; Malik, 2001; Khoo, 2012; Isa et al., 2013a & 2013b on so forth) (Refer to summary of the previous study in Table 1.1). The historical geography and sociology disciplinaries provided the reference sources related to pictorial histories, economic statistic data, demographic record, and the old map. All aforementioned literature studies vitality to convey the heritage tin mining town in the city planning and urban history research scope. Besides, the understanding of the mining town characteristic, typologies and attributes of Malaysia cultural landscape contributed studies by Ahmad (2013); Abdullah (2011); and the ecological changed in the urban spatial pattern by Abdullah and Hezi (2008). Also, Ahmad and Jones (2013a, 2013b) studies on mining landscape heritage conservation in Kinta Valley in Perak has devoted to the understanding of the heritage significance of mining landscape assessment.

Aforementioned, although many historical studies are related to Malaysia tin mining industry, there is still insufficient research is related to the industrial heritage and heritage conservation on tin mining town. Herein, to bridge the research gap, it will be a focus on the evolution of heritage tin mining town in Malaysia context. Therefore, in the research scope, it is to examine historical fact of tin industrial transformation and the process of tin town urbanisation. This research prospect is to expand the understanding of physical and related social heritage in remaining by the heritage mining landscape, the tin mining town morphology pattern and the assessing of significance heritage attributes.

Table 1.1: Summary of the previous studies.

Author	Title	Summary
Wayte, M. E. (1959).	Port Weld. <i>Journal of the Malayan Branch of the Royal Asiatic Society</i> , 154-167.	<ul style="list-style-type: none"> Port Weld development and settlement (local livelihood), port functions and transitions industries impacted to Port Weld, the declining of port because of the railway truck running from Penang to Singapore, the rising of road transport, increasing shallowness due to the coastal sedimentation and Japanese occupation the rails were pulled up to be used for the railway of death in Siam but then were replaced.
Yip, Y. H. (1969).	<i>The development of the tin mining industry of Malaya</i> . University of Malaya Press.	<ul style="list-style-type: none"> Overview of Tin (types, forms and grades, uses, supply and demand); Malaya in tin production (method, economy importance, ownership and operation, smelting and resource's); marketing (tin price and market trade); international control. Early development of Tin industry to 1900s; Chinese Enterprise, Western enterprise, the developmental of tin industry; tin industry transition (1900-1920), year of expansion (1920-1930)

		<ul style="list-style-type: none"> • Year of tin industry control (1930-1941), tin international control and agreements.
Khoo, K. K. (1981).	<i>Taiping, ibukota Perak. Persatuan Muzium Malaysia.</i>	<ul style="list-style-type: none"> • Early history about Taiping. Taiping became capital of Perak, community (ethnic), sport, infrastructure, residency houses.
Khoo, K.. (1991).	Taiping (Larut): The Early History of a Mining Settlement. <i>Journal of the Malaysian Branch of the Royal Asiatic Society</i> , 1-32.	<ul style="list-style-type: none"> • Early history of Taiping town, the early Chinese miners, disturbance of Larut, beginning of Larut (in 18th) • The transition of Taiping and Matang.
Khoo, K. K. (2002).	<i>Tanjong, Hilir Perak, Larut and Kinta The Penang-Perak nexus in History</i> In the Penang-Story – International Conference 2002, 18-21 April 2002, Penang.	<ul style="list-style-type: none"> • Early scenario to the related tin industry in between Penang and Perak. • The cases of socio-economic strata and ethnical eminence (plural society) at Tanjong alias George Town, Larut, Kinta.
Malek, M. Z. A. (2001).	<i>Larut Daerah Terkaya.</i> Penerbit Universiti Kebangsaan Malaysia.	<ul style="list-style-type: none"> • Early history of Larut Mines. The establishment of Larut district, Larut wars (civic wars), Malay chief administration, socio-politic changes, formation of Larut, Matang and Selama District.
Khoo, S. N., & Lubis, A. R. (2005).	<i>Kinta Valley: pioneering Malaysia's modern development.</i> Areca Books.	<ul style="list-style-type: none"> • Early history of Kinta Valley (site background). • Kinta formation (secret societies, sanitation, health, river, roads, railways, agriculture and colonisation) • Types of mining methods (Early miners, Chinese, European), tin smelting, and tin economy. • Kinta towns (15 towns)
Tetsuo, T. (2009).	<i>Chinese-Operated Tin Mining in Perak during the Late Nineteenth Century : A New Style of Labour Employment and the Problem of Absconding</i> , Volume 3: 263–265. Chinese Southern Dispora Studies.	<ul style="list-style-type: none"> • Mining industry in Perak (tin productions and the Chinese immigrant), the labour employment in Larut and Kinta (labour system, kongsi system, cases of criminal)
Zen, I.H (2011).	<i>Managing historic Cultural Landscape Resources for Tourism: Case of Sungei Lembing and Mersing in Malaysia.</i> In Book chapter: Nurturing nature for man. IIUM press International Islamic University Malaysia. (pp.31-40).	<ul style="list-style-type: none"> • Two study cases related on the historic cultural landscape of Sg. Lembing and Mersing about the heritage values conservation are essentials for tourism revenue and sustainability.
Abdullah, S. A. (2011).	<i>The Characteristics of the Cultural Landscape in Malaysia: Concept and Perspective.</i> In <i>Landscape Ecology in Asian Cultures</i> (pp. 41-53). Springer Japan.	<ul style="list-style-type: none"> • Case study: Merbok estuary in Kedah state. • Highly developed states may have a poorer cultural landscape compare to less developed state. • Cultural landscape in Malaysia on the concept and perspective. Basically, agricultural formed the main factor of cultural in Malaysia but it also depend on geographical location and also coastal sites. • Findings: Traditional feature: local people have

		<p>developed the relationship closed to the feature, eg: mangrove forest (natural and non-natural feature); historical feature (archaeological features/historical site); non-traditional feature (a man-made feature for cultural landscape such as agricultural plantation).</p> <ul style="list-style-type: none"> • Other factors: include geological events, early human settlement by people from other continents, and the cultural and traditional backgrounds of various ethnic groups, including religious and socio-economic development.
Ahmad, S., & Jones, D. (2013a).	<i>The importance and significance of heritage conservation of ex-tin mining landscape in Perak, the Abode of Grace. In ACAS 2013: Intersecting belongings: cultural conviviality and cosmopolitan futures: Proceedings of the Asian Conference on Asian Studies 2013</i> (pp. 38-54). The International Academic Forum (IAFOR).	<ul style="list-style-type: none"> • Case study in Kinta mining towns (e.g:Ipoh, Gopeng, Kampar, Batu Gajah,Tronoh) • Issues highlighted: most of the abandoned mine have been reclaimed and converted into more profitable land uses such as residential, commercial, institutional, agriculture and recreational purposes. In another words, also pin point the ex-mining lands conversion distresses the ‘loss of industrial relics’. • Importance of mining conservation in Perak possessed the tin manufacture history, technology for extracting tin, the early transportation, and infrastructure, social, and economic development. Therefore, this heritage site needed to be conserved. • The heritage conservation and the past mining activities essentials to promote tourism activities.
Ahmad, S., & Jones, D. (2013b).	Investigating the Mining Heritage Significance for Kinta District, the Industrial Heritage Legacy of Malaysia. <i>Procedia-Social and Behavioral Sciences, 105</i> , 445-457.	<ul style="list-style-type: none"> • Case study focused in Kinta district in Perak, Malaysia. • Identified the character of mining heritage site: National Heritage Malaysia (2005); ICOMOS Australia; Heritage significance and value (Pearson and Sullivan, 1995); World Heritage List of cultural landscape (Dozolme, 2013); the list of mining features that to be recorded (Pearson, and McGowan, 2000) • Assessment for heritage significance: Australian, national criteria for assessing of mining landscape (Pearson and McGowan, 2000); Historic Landscape Characterisation (HLC); legislation on heritage conservation in Malaysia: Urban Development Corporation Act 1971 (Act46), Town and Country Planning Act 1976, Federal Territory planning Act 1982, Town and country planning Act 1995 (Revised Act 933) etc. • It should be reviewed the mining site as being part of cultural heritage conservation obligations
Isa, A. et al.,(2003a)	<i>The study of Taiping street's name</i>	<ul style="list-style-type: none"> • 60 Taiping's historic street name inventory, • Suggestion guidelines for the Taiping's street name, installation heritage street signage, renaming existing road.
Isa, A. et al.,(2003b)	<i>The study of 19th & 20th Century Sculptures and memorials Trails</i>	<ul style="list-style-type: none"> • Inventory sculptures and memorial (allocation condition and history background), Taiping marketing plan, Taiping heritage marker program (tourism purposes).
Osman, R. M (2013)	<i>Rate of Development of Ex-Mining Land in Peninsular Malaysia.</i> National Geoscience Conference 8-9 June, Kinta Riverfront Hotel & Suites, Ipoh.	<ul style="list-style-type: none"> • Needed a proper monitoring and planning to ensure that the provisions of these ex-mining lands are adequately developed and conserved for current and future generations. • Predict the rate of development of the ex-mining land in Peninsular Malaysia will develop to other land uses in 2028.

Harun, N. Z., Mansor, M., & Said, I. (2013).	<i>Diversity as the physical correlate to open space's experience in two historical towns.</i> AceBs Hanoi Conference.	<ul style="list-style-type: none"> Identified the open spaces characters in Taiping Lake Gardens and Padang Kota Lama. And became as important urban space to support people in variant physical activities, being the great urban form of the town, maintain urban fabric and remaining the image of both historic towns. Therefore, the place making inevitable congregated with “people, places, movement, urban form, nature, the built fabric and the processes contain within its making.”
Ahmad, R. (2013).	<i>Cultural landscapes as heritage in Malaysia: Potentials, threats, and current practices.</i> Utrecht University.	<ul style="list-style-type: none"> Six typologies of cultural landscape have potential to be nominated as national heritage: i) rice paddy landscape; ii)Felda settlement; iii) traditional village; iv)Fishing village; v) Minagkabau settlement; vi) Hill resort area of mixed farming. Former mining area of Kinta Valley is not selected because the site lack of integrity. All above cultural landscape chosen based on less developed area (not urban or industrial development area). This heritage landscapes persistence the intangible values such as traditional or local cultural practice.

1.4 Research aims

This research purpose is to ascertain of the evolutionary mining town and the industrial landscape transformation over the time. Herein, the examinations of the physical and social heritage changed by validating the interface of tin mining town changed, industry landscape mechanism, the social impact and the cultural values of a mining town in Malaysia context. Besides, this study attempts to evaluate the essential mining town characters tie to the heritage significance of the historic tin town conservation. The related mining town attributes comprises the prior history, physical spatial pattern (tangible heritage aspect) and socio-cultural factor depicting to the mining town’s identity. These entire heritage attributes are vitality contributes to the determined values and cultural heritage significance of mining town, and these may consider for heritage conservation.

1.5 Research hypothesis

The principal tin mining town in Malaysia characterised by the combination attributes of geographical setting, physical landscape, and socio-cultural feature. Mining landscape in Malaysia mainly influenced by the historical geography, colonial heritage landscape (British colonialism), and socio-cultural composition inherited from the plural society. Socio-economic was a substantial factor to signify human-modified the natural landscape through tin mining in the Malay States (Malaysia). Herein, British colonial

penetrates their political power to control mining economic and tax collection while the immigrant Chinese and Indian labours engaged with mining and railway track constructions respectively. In such, the economic and sociocultural attributes had witnessed the mining industry process in pertaining industrial society as well as the identity of the post-industrial landscape.

1.6 Research objectives

To achieve the research aims, the following objectives are formulated;

- 1) To identify the evolutionary transformation of a mining town and its landscape through land use and urban morphology analysis.
- 2) To investigate the social structure of a mining town shaped by the tin industrialisation.
- 3) To determine the heritage attributes of a mining town for future heritage conservation.

1.7 Research Questions

1. What is the physical evolutionary of a mining town?
 - i. What are the physical landscape characters of Taiping tin town?
 - ii. How do the mining town and the industrial landscape formed?
2. How does the social structure changes from the mining industry?
 - i. How does the local lifestyle changes during the period of tin industrialisation?
 - ii. How do people perceive and continues their social lifestyle at the ex-mining town?
3. What are the attributes in characterising a mining town or the townscape?
 - i. Why does the mining town need to be conserved?
 - ii. How to evaluate the mining landscape heritage significance and values?

1.8 Significance of the study

There is the deficiency study about industrial heritage and the heritage mining town in Malaysia. Therefore, this study devoted to the understanding the importance of cultural heritage conservation on the industrial heritage mining town and landscape in Malaysia. In the theoretical point of views, the industrial landscape is a category of cultural landscape; the landscape had modified by man through an industrial process (culture) (Stuart, 2012). This research finding proved the industrial mining town and landscape in Malaysia were adaptive change by the tin industrial process during the 19th century. It is how the factor of human industry activities transformed a natural landscape plain into a mining town associated with the industrial infrastructure. The mining town transformation recognised through the geographical setting (the location of the tin belt and alluvial plains), land use, the dynamic historical economic (tin mining is the oldest industry in Malaysia) and urban transformation. Also, the significance of socio-cultural aspect disclosed tin industry society and social spaces were created unintentionally by the British colonist in a tin mining town planning. Concurrently, this study reveals Malaysia tin industrial heritage interrelated to the Southeast Asian diaspora (south sea or 'Nanyang') of the Chinese worker migration from mainland China as well as the evolutionary of mining technology invented by European tin company.

Subsequently, the mining town and landscape evaluation were traced by the use land mechanism, morphological spatial pattern, and socio-cultural impact of the tin industry. The overall mining town changed outlines through the historical chronology timelines. The historical period study began on pre-colonial era; during the British colonial period closed to 19th century; and the post-colonial era (after independent in 1957s till present). Through entire industrial landscape development, mining town formation, the social structure of a tin town is related to mining site, industrial transportation, social infrastructure and facilities. Hence, the result of mining landscape mechanism and the significance attributes are synthesised via a model of a morphological mining town. The analytical models help to express the urban morphology of a mining town. Whereas, the mining town and attributes justification consists of the geography setting; historical factor; socio-economic; British colonial heritage and socio-cultural aspect. These findings have mentioned above was directed local people awareness on mining landscape conservation and management.

1.9 Research Scope

This research mainly focuses the evolution of mining town in the case of Taiping in Larut district. Taiping had chosen as a case study because of its rich historical background, and it was the oldest heritage town developed from the mining industry in the mid-18th century. Taiping was the first planned town of Federated Malay States (FMS) under British colonialism period of political and economic intervention. Since the first tin minerals found at Larut district, the high number of the Chinese diaspora and later Indian worker invasion to Larut and Malay State. Therefore, it began to open up a new chapter of Malaya tin industry intertwined by indenture workers.

Secondly, it was known that the cultural landscape integrity of open cast mining grounds had changed vigorously. Notwithstanding, the potential of physical mining landscape such as the land use pattern, settlement and post-colonial landscape were the most important indication of industrial heritage properties. So, Taiping possesses ‘thirty-three of many firsts’ encompasses the tangible and intangible of built legacies and townscape inheritance by tin industrialisation. In the nutshell, the unique colonial heritage landscapes and townscape advocated Taiping as a unique heritage mining town (refer to the detail discussion in chapter 4).

Thirdly, this study would be apparent to discuss other tin mining towns in Malaysia context. Hence, by introducing typologies and the phenomena of the cultural landscape of Malaysia in Chapter three is to emphasise where mining landscape stand as a nation cultural heritage. In additionally, it is important to analyse and distinguish mining landscape attributes of Taiping with Kinta Valley district and Sungai Lembing mining town. Due to this study looking at the historical landscape change, Kinta tin became the most prolific mining sites in the 19th century had replaced Taiping a mining centre in Perak state. In coinciding, Sungai Lembing is another notorious the world deepest underground mining situated at the east coastal of Malaysia. In this matter, the quintessence mining landscape characteristics imply to the argument on the key attributes that constituted to a mining town, and the reason of the tin mining landscape have to protect as the cultural heritage.

1.10 Limitation of study

This study was mainly focused and discusses in the evaluation the characteristics of a tin mining town in Peninsular Malaysia which is not including the East Malaysia of

Malaysia Borneo (Sabah, Sarawak and Labuan). It is because, the tin belt and the geographical setting of tin mineral only found in Peninsular Malaysia. This research does not include the discussion of the ecological impact, and environmental issue of mining landscape changed. In which, the research considerations of the industrial mining landscape change factors are relating to the history of tin industry, physical landscape evolution and social factor. In the mechanism of Industrial landscape transformation, utmost about industrial heritage is the distinctive tin industry society, socio-cultural, economic and exclusionary on the political-social evolution discussion via tin industrialisation.

Virtually, these entire all above mentioned tin mining town parameters to reveal the continuous and impacts from the tin mining industry. Thus, Taiping tin town was selected as the core case study, and the comparison case with another tin mining town in Malaysia is to generalise the physical and sociocultural facets of mining landscape characters establishment through time. Moreover, yet, the used of examples UNESCO World Heritage site industrial mining region or landscape and its Outstanding Universal Values (OUV) in the literature discussion vitally to determine the constitution of tangible and intangible mining landscape attributes. In short, the determinant the sampling of the mining town and landscape attributes through landscape evolution studies is the consideration for the significant industrial heritage conservation.

1.11 Research Methodology

This study is conducted through qualitative research design mainly to identify the characteristics and the transformation of the tin mining town and the industrial landscape. Taiping's case study is profoundly shaped by the historical development of tin industry during the British colonial period since 1874s. The Nizhny Tagil Charter discloses the importance of the industrial heritage research is to identify, to record and to inspect the existence of the industry (TICCIH, 2003). Furthermore, the method of recording in industrial heritage study encompasses the "descriptions, drawings, photography and video film, with references to supporting documentation" (Ibid, 2003). Moreover, yet, Alfrey and Clark (1993) elucidated the industrial landscape studies derived not only based on the physical evidence analysed (e.g.: building, spatial formation, archaeological legacy and urban pattern), but to certify that the changes also directed to the industrial development. Both authors showed the implementation of archaeological study for Iron Bridge Gorge in Shropshire, England by collecting the interrelated buildings, plots and pre-historic landscape data.

This research methodology divided into four stages, illustrates in Figure 1.1. Literature review used to filling research gap and elaborate past studies (Cooper, 1984; Marshall and Rossman, 2006) and further in comparison or contrasting on result and findings (cited in Creswell, 2009). Initially, literature study is to rationalise research gap and to refine research problem. The secondary data obtained from the understanding and conceptions of the industrial landscape; values and evaluation of industrial heritage; cultural heritage conservation approach; and British colonialism on urban planning. In particularly, the theoretical reviews and synthesis intended to develop a conceptual framework. Therefore, in this literature studies comprises history geography, industrial heritage, cultural landscape, urban design and also the UNESCO world heritage site as reference studies. The compilation of secondary data is the historical documents, local municipal council report, maps source, old photographs, books and journal papers. All the historical document research and theoretical reviews are needed to validate industrial heritage progression, the cultural landscape characteristics and attributes of the Taiping tin mining town.

As the consequence, the primary data collection obtains from a case study. Two field studies are conducted to ascertain the site issues, the mutual connection of current physical development, socioeconomic changes, and culture lifestyle of Taiping (the industrial landscape site). The field inventory covers Kuala Sepetang, the former Port Weld in the past. All the primary data accomplished thru contextual study, site observations, photograph records, and interview (including local authority; President and members of Taiping Heritage Society; and local people). Hence, second field survey virtually to explore other tin mining towns of Kinta Valley district (including Ipoh, Gopeng, Papan, Kampar, Pusing, Batu Gajah and Tronoh) and Sungai Lembing located at Pahang, east coast of Malaysia. Certainly, the field inspections helped to apprehend in-depth mining landscape characteristics in Malaysia and to determine necessary empirical data be valid for analysis. As both the theoretical studies and field survey carry out to evaluate the evolutionary change and heritage significance of mining landscape.

Next, the third stage is primary and secondary data synthesis assists the analyses of the industrial historical process, the physical land use pattern, and comprehends the tremendous social impact from the mining industry. Land use is the solitary aspect that ensures landscape characters (Eetvelde and Antrop, 2004). As revealed by Stuart (2012), every history materials should be “mapped and overlaid for initial landscape characteristic assessment.” Land use evolutions were chronologically described as the differences of tin industrial historical periods and the mining landscape succession formation. There are eight different sketch map, land use map, and cadastral maps of Larut district, year circa early

1840, 1874, 1931 and 2000 to plot series of Larut District land use maps and Taiping morphology maps. The list of references map as follows;

- i. Land Survey Department. (16 April, 1941) *Taiping Parts of Krian, Larut & Matang Districts, Perak*. (no.2-M-3).(1:50,000).Tokyo: Map Room, National Diet Library.
- ii. Land Survey Department. (16 April, 1941). *Trong Parts of Matang, Kuala Kangsar, Larut Districts & Dindings Territory, Perak & Dindings Territory*. (1:50,000).Tokyo: Map Room, National Diet Library.
- iii. Land Survey Department. (16 April, 1941). *G. Bubu Parts of Kuala Kangsar, Larut, Matang, & Kinta Districts, Perak*. (1:50,000). Tokyo: Map Room, National Diet Library.
- iv. Land Survey Department. (16 April, 1941). *[Bagan Serai] Parts of Krian, Selama & Larut Districts, Perak*. (1:50,000). Tokyo: Map Room, National Diet Library.
- v. Taiping and Port Weld: scale approximately three miles to one inch. Journal Malayan Branch [Vol. XXXII, Pt. 1]
- vi. Federated Malay States Railways (1921). *Pamphlet of information for travellers*. p.37. Retrieved from: <http://seasiavisions.library.cornell.edu/>
- vii. Taiping Municipal Council (2013). *Taiping's Many Firsts Report*. Taiping Municipal Council.

Eventually, five land use maps were produced through scanned hardcopy maps, digitised imaging and overlaying using computer-aided drawing (AutoCAD version 2010) and raster graphic editor (Adobe Photoshop CS5). The colour and specification of land use map presentations by using the Microsoft Publisher 2010 and Adobe Photoshop CS5. The land use analyses cum old photographs upheld the profound changes in the physical landscape and testified the obsolete mining landscape. Moreover, the micro scale morphological pattern of Taiping mining town was discussed and concise interpreting into the tin town evolutionary model in the graphic layouts.

The following social structure descriptive analysis evidenced by the analytical data attached to the illustration diagram of the ethnical composition. The interview transcription supported the intangible meanings and memory of Taiping's mining town. At the final stage are the findings and qualitative content analysis discussion. In which, this research delineates the results of the physical transformation (land use and morphological studies) and social impact of the industrial landscape as well as the significance landscape attributes that characterising the post-industrial landscape. In this finding, comparison discussions of Taiping with Kinta Valley and Sungai Lembing mining towns in Malaysia define distinct mining landscape characteristics and attributes indispensable criteria for future cultural heritage conservation.

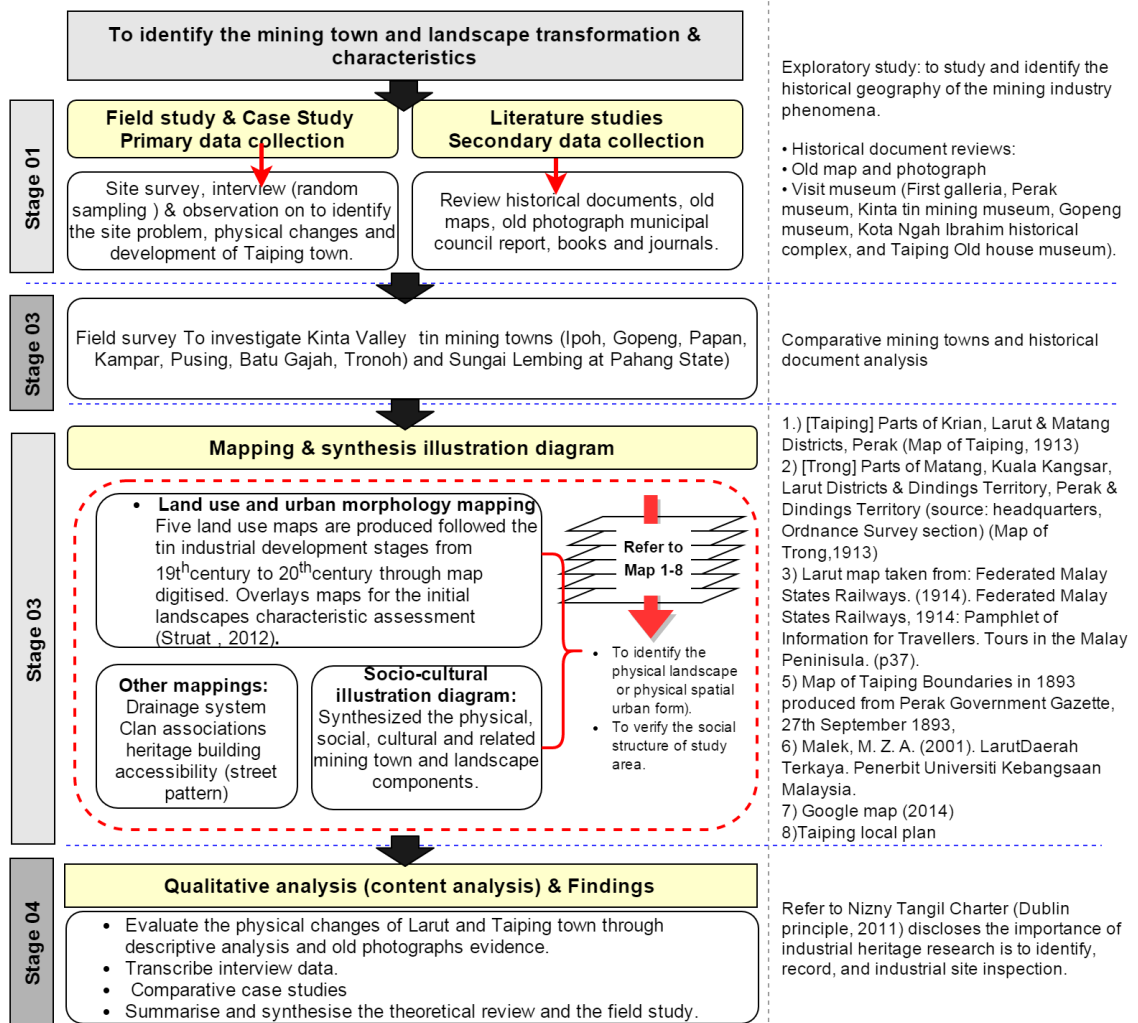


Figure 1.1: Outline of methodology study.

1.12 Structure of dissertation

The summary of organisation dissertation chapter illustrated in Figure 1.2. This research structure constituted by six chapters and the detailed discussion of each chapter elucidated as followings;

i. Chapter 1: Introduction

In the first introduction, the chapter is to present the associated historical development background study of Malaysia tin industry heritage, impact of the tin mining industry, the relics that supported to the mining industry and related issue. Subsequently, the discussion is to define the research problem statement, research

gap, research questions, research aims, objectives, research scope, research significance, and limitation of the study included in this chapter. In brief, the explanation of research methodology and dissertation chapter with reinforced by the illustrated research method flow chart and dissertation outlines.

ii. Chapter 2: Theoretical reviews

Theoretical reviews in chapter two divided into three parts. Initially, is to discuss the general conception and theoretical meaning, values and typologies of Malaysia cultural landscape, mining settlement, industrial heritage and industrial landscape. The second part is to elucidate the British colonialism and urban planning via the ‘Grand Modell’, model of South-east Asian cities, morphological understanding of entrepot cities, colonial city planning development and colonial heritage landscape. It is essentials to highlight the industrial heritage mining town and landscape of UNESCO World Heritages with its identification Outstanding Universal Values and criterions on the cultural landscape and mining landscape assessments. This chapter also includes the National Heritage Act and strategy of cultural heritage conservation in Malaysia. In sum, the perspective of heritage mining town and industrial landscape allied to cultural heritage conservation will be discussed.

iii. Chapter 3: Perspective of tin mining town and industrial landscape in Malaysia

Subsequently, in chapter three is to underpinning and investigate the overview background, and characters of the tin mining town in Malaysia. The Mining landscape in Malaysia will describe by its historical context, mining method and technology, and the labour and employment system. Furthermore, the assessment of tin industrialisation impacts in the Malay States is the small town urbanisation, economic transformation, social infrastructures expansion and the demographic changed. This chapter will also expound the similarities and divergence mining landscape characteristics of Kinta Valley mining district (Ipoh, Gopeng, Kampar, Batu Gajah, Papan, Pusing and Tronoh) and Sungai Lembing underground mining town. In all, the important Malaysia mining town character discussion and findings are importance for typologies and characters mining town justifications.

iv. Chapter 4: Case study on Taiping tin mining town

Chapter four to clarify the historical background of a Taiping tin mining town. This case study research deliberates the physical development of Taiping the tin mining town, the impact of tin industry and heritage townscape. In this chapter, the identification of physical and social tin mining town characters are to define the notion of British colonial urban planning and tin industrial landscape formation. As following, the synthesis of comparative studies of Taiping (Larut), Kinta Valley district and Sungai Lembing tin town. The comparative studies outcomes are necessary to clarify the key mining landscape attributes for the significance mining town and industrial landscape heritage conservation. The last part of this chapter 4 discussed the current Taiping phasing plan development implemented by Taiping Municipal Council. Herein, the summary points concisely the gap of heritage planning organised by the town council.

v. Chapter 5: Analysis, findings and discussions

Chapter five demonstrates two part of the analysis and research findings. The first part discussion interprets the evolutions land use analysis and morphology pattern of industrial heritage through the chronological timeline. The second part carries out the analysis of physical charters of Taiping tin town consist of the drainage system, heritage building, visual character and legibility of Taiping historic townscape. This finding exposes the social changed influenced by tin industrial heritage. In this analysis section, it is imperative to show the social structure composition and social structure integration with the physical heritage of a Taiping tin mining town (the evolutionary of social pattern and clan association). The summary of the conclusion in chapter illustrates the significant mining town attributes which present in the urban morphological model.

vi. Chapter 6: Conclusion and recommendation

All the preceding chapters encompass the literature reviews, Malaysia tin mining town and industrial landscape perspective, case study analysis and finding assisted in the conclusion discussion. In the final definitive summary, the first part is to clarify the characters and typologies of the tin mining town in Malaysia. Secondly, regards to the detailed analysis of Taiping tin town, the essences of tin mining town characters is validated by the physical colonial planning in the tin mining town and

plural society formation. The finding implication will be helpful for Taiping mining town in the industrial landscape and historical townscape heritage conservation and recommendation.

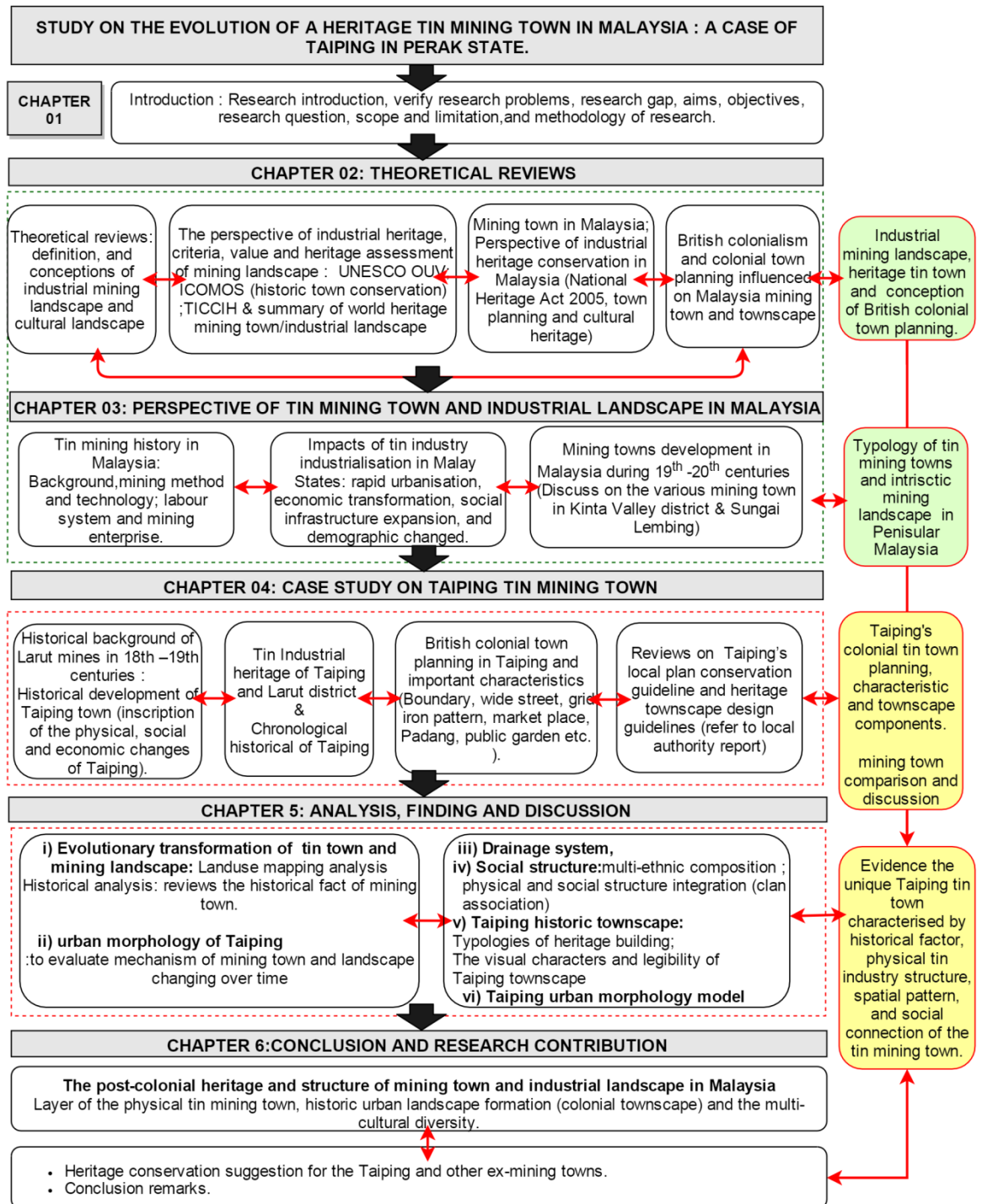


Figure 1.2: Dissertation chapters.

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CHAPTER 2

THEORITICAL REVIEWS

2.0 Introduction

The aims chapter is exploring the literature studies related to the notion of heritage tin mining town. Through the theoretical reviews is to achieve the understanding of mining town in coinciding to industrial mining landscape and industrial heritage. This chapter is important to implicate the theoretical discussion of the mining town in heritage conservation. Therefore, this chapter two is divided into four subsections for future in-depth discussions. For the first part, is to discuss the definition and overviews of the World Heritage cultural landscape, industrial mining landscape and the UNESCO's Outstanding Universal Values (OUV) assessment. Also, to discourse the typologies of Malaysia's cultural landscapes and its landscape characteristics respectively. In the second part of the literature review, the perspective of industrial heritage is vitality to identify the mining industry values, evaluation criteria, and the historic urban landscape conservation. By interpreting and synthesising various theoretical implications, methodology and heritage conservation approach to constructing a theoretical framework for supporting the thematic study on heritage tin mining town. Thirdly, is to elucidate the British colonialism and colonial town planning in Southeast Asia context that is including Malaysia and other third world colony countries. Moreover, the discussion part including the colonial heritage townscape and model of Southeast Asian cities which help to comprehend the structure of Malaysia mining town. Moreover, the final part of literature studies indicative the examples cases of the nomination world heritage sites related to the mining industry and cultural landscape. Further, these precedent studies are substantive to outline the appropriate historic tin town management and heritage conservation for a historic tin mining town. In short, the gist of literature studies attempts to fill the gap of mining town study in Malaysia.

2.1 Meanings of cultural mining landscape and industrial heritage

According to the UNESCO's cultural landscape definition, delineates as a combination of natural, man-made landscape and how people modified the natural landscape till present functions (ICOMOS, 1992 paragraph 35 and Aplin, 2007). Such Siririsak and Akagawa (2007) defined both past and present human's history reflected the notions of the cultural landscape. In this circumstance, the differences of cultural environment, geographic, and contextual influence to the cultural landscape characteristics. In addition, both authors deliberated the natural and cultural components indispensable to measure the heritage of cultural landscape (Ibid, 2007). It is because the UNESCO World Heritage Convention emphasised heritage was equally to cultural heritage and natural heritage (Ahmad, 2006). Indeed, the World Heritage Convention has justified that 'cultural and natural' are the criteria of Outstanding Universal Values (OUV). The identifying of OUV in mining cultural landscape encompasses the essential criterions of the architecture or technology, town planning or landscape design, landscape ecology process (bio-diversity), infrastructure, mining landscape related industrial and cultural landscape, mining town or settlement, mining technology and the unique cultural associated with humankind activities.

Landscapes in an extensive historical are meaning the physical manifestations of the natural environment changes by the men activity through space and time. Hopkins (1955:14) revealed the notion of a place or landscape was the documented human history and yet in depicting as people way of life (cited in Taylor, 2008). In other words, landscape express people's story, events and place through time, offering a sense of continuity and the cultural background of cultural heritage (Ibid: 2008). Hence, Franz Boaz in Taylor (2008) disputed his view on anthropology and geography studies where historical analysis is significant evidence of culture. He emphasised landscape (in cultural landscape) was the hint to understand people's culture changed thru a place, time and also the context where they interacted. There are three categories of cultural landscape inclusion and recognised by the UNESCO World Heritage Convention. There were identified as i) Clearly defined landscape designed by man (or man-made landscape), ii) evolved landscapes (inclusion a relict or fossil landscape and continuing landscape) and ii) the associative landscape (connected with religious, cultural and natural elements) (cited in Mitchell et al., 2009). Cleere (1995:66) emphasised that implication of relic landscape is an ancient industrial landscape associated with industries such as mining, quarrying and the production of metals, glass and textiles. This landscape type was extending during the 'gold rush' periods in 19th and 20th centuries in Australia and North America. Thus, Stuart (2012) had pinpoints industrial landscape was belong one of the cultural landscape

classifications. He exposed the cultural process was the implication of human activities whereas industrial activity had modified the landscape.

The emergence of industrial archaeology interdisciplinary is representing the International Committee for Conservation of Industrial Heritage (TICCIH) directing to “study, protect, conserve and explain the remains industrialization” (TICCHI, 2003). In which, the industrial heritage implicates of “history, technology, machinery, social, architectural or scientific value” (Ibid, 2003). Which means, industrial heritage was exemplified by old factories; ex-mines and industrial sites operated by energy generation, material, transport, infrastructure and community engagement with the related industrial activities. Pearson and McGowan (2000) also clarified the industrial sites denote as “a place where minerals and other minerals of value were excavated from the earth through mining processes, mills, smelters and refineries by the built infrastructure (e.g., dam and railroads).” Succinctly, the industrial landscape purports the site itself, fabric, components, types of machinery, settings, memories, traditions and customs (Cossons, 2012). The industrial heritage values signified the tangible and intangible chronicles of the industrial histories which might devote an identity for a sense of place or community (Ibid. 2012). Therefore, the values of the industrial heritage especially the mining site are vitality to justify by its historical fact, technological modernisation or the human history directed from the industrial changed.

Currently, there are twenty-four listed industrial sites declared by UNESCO as a world heritage mining site. In 2007, the first Asia’s world heritage mining site awarded by Iwami Ginzan silver mine is in Japan. It was notables of its veritable cultural landscape and the largest silver producer in the 16th to the 17th centuries. Iwami Ginzan retained the “continuing landscape” as its traditional way of life by still supporting resident dwellings and livelihood which were inherited from the past generations. The OUV’s justifications comprise the first international East Asian trading (significant cultural and commercial interactions); silver mining site, mining towns, transportation route or Kaido, port facilities, mining technique and refining silver technology (the Haifuki cupellation method) (quoted in Shimae Prefectural Board of Education, 2008). Iwami Ginzan cultural landscape was the integrations of the natural landscape and archaeological legacies with distinctive land use system to present silver heritage industrial, live and livelihoods (Ibid, 2008).

Likewise the European’s mining landscapes, the Cornwall and West Devon in United Kingdom was nominated as the world heritage site in year 2006 (Source: <http://www.tellusgb.ac.uk>). It was known as Cornish mining heritage with the cultural integration of urban and rural landscapes transformations. Cornish mining was the world

greatest copper and tin manufacturers; flourishing 214 years produced two-third of the world's copper. The OUV assessments criteria included the metalliferous mine production; mining transportation; ancillary industries; mining settlement and social infrastructure (e.g., cottages, chapels); mineworkers' smallholdings (small subsistence farms); great house, estate and gardens; and scientific importance of mineralogical (cited in <http://whc.unesco.org/>).

Aforementioned with two reference studies highlighted the authentic and integrity of mining landscape characterised by its site's history, intrinsic industrial heritage process, landscape transformation, building, industrial site, spatial structure, land use pattern, cultural attributes and economic entities to generate a sense of place. Hence, the natural, cultural and heritage components are necessary to strengthen the significance of industrial landscape. As stated by (Akagawa and Siririsak, 2008:188), to avoid new conflict or degradation of a place, the protection of industrial cultural landscape could be integrated into city planning and development rather than setting it aside as separate measure as part of heritage conservation.

2.2 Industrial landscape assessment and categorisation

Initially, to study on industrial landscape was endeavour to comprehend the full historical amplitude of an industry or industries site and to appreciate the heritage values (Stuart, 2012). There are three method of analysing industrial landscape underpinned by Palmer and Neaverson (1998). The authors have summarised industrial landscape studies justification are though: i) the purpose and location of the industry; ii) understanding the industrial changes through time, iii) the mutual spatial relationships with the expansion of dwellings pattern and transport networks. The significance of industrial landscape can be assessed through the standard heritage criteria for instance the Burra Charter (cultural significance) and the English Heritage (Stuart, 2012). Stuart (2012) emphasises the importance of industrial landscape verification is to discern the exact how industrial fabricated, shaped the environment, and the heritage values generated via related activity. The manual of mining heritage place assessment prepared by Pearson and McGowan (2000) for the Australia mining field study is one of the reports unveils the importance to document, analysis, and the heritage significant assessment on a mining place. The authors unveil the attributes for assessing a heritage mining site through the historical evidence that associated to a place and mine as;

- a) The processing of batteries and mills such as smelter and refineries;
- b) Mining worker house, villages and town;

- c) Road and tramway related to mining transportation or movement;
- d) Infrastructure that can support mining sites such as water supply, timber mills, smithies, foundries and hydro-electric plant;
- e) Extension of settlement initiated by mining industry for instance: agriculture, farming, port development, railway extension;
- f) The landscape changed caused by mining activities such as pollution, deforestation, open cuts, tailing dumps, dredge streams and so on.

Palmer and Neaverson (1998) has categorised four major types of industrial landscapes and the divisions are a) linear landscape, b) geologically determined landscape; c) production determined landscape; and d) townscape as followings;

a. Linear landscape

Linear landscape interpreted as utilise either the water-power sites along streams and rivers or methods to transportation like railways or motorways. For example, there is some man-made watercourse operated for both power and transport in Britain and Europe.

b. Geologically determined landscapes

The geologically determined landscape is to make use of the raw material grounded in a special region like preindustrial and industrial mining regions.

c. Production determined landscapes

The production determined landscape definite to develop the special settings of production and labour in a region. For instance, the industrial landscapes based on fabrication are the textile industry or the latest semiconductor industry like Silicon Valley in California.

d. Townscapes

Townscape prototype in the industrial landscape is comparable to the landscape. The industrial town or city influenced by differences structure construction particular to the industry. Hence, many industrial towns and cities have developed in special areas or a centre for commercial, transport communications and inhabited settlement. Through the many industrial infrastructure developments in each town or city is remarkable as the significant townscape or landscape.

2.2 The World Heritage mining town and industrial mining landscape

Mining sites or mining town notorious as a sub-classification of the industrial heritage group. Since 1997, UNESCO had recognised cultural heritage sites industrial heritage monuments and properties to include the mining landscapes or mining regions as world heritage site (Fleming, 2012). At present, there are overall sixty protected industrial sites affirmed by UNESCO World Heritage Centre and twenty-four sites interconnected to the mining industry. There is fifteen world heritage mining sites (highest percentage: 62.5%) dominated by the Europe and North American region and eight number of UNESCO industrial mining sites (33.3%) are located in Latin America and the Caribbean region (illustrated in Figure 2.1). In contrast, the Iwami Ginzan silvers mine (4.2%) and its distinctive cultural landscape was the only representing site of Asian and Pacific regions. All the designated mining sites and its cultural landscapes are evaluated under the cultural criteria. Essentially, testimony of the first UNESCO nominated on industrial mining site was Wieliczka Salt Mine in Poland (1978), subsequently adopted by the Røros Copper Mining Town in Norway (1980), continues to Ouro Preto Gold mining town located in Brazil (1980) and so forth (refer to Figure 2.1 and Table 2.1: the summary of the world heritage mining sites).



Figure 2.1: The distribution of mining sites and mining landscapes by regions inscribed in the UNESCO World Heritage list.

Lardner (2012) spotted there are six selection criteria refer to the UNESCO World Heritage and usually one heritage site justification is more than one criteria. The principal of evaluating the heritage significant are homogenous to the Operational Guidelines for the

implementation for the implementation of the world Heritage Conventions (<http://http://whc.unesco.org/en/guidelines/>).

- i. Criterion (i) refer to representation of a masterpiece of human creative genius;
- ii. Criterion (ii): to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- iii. Criterion (iii): to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- iv. Criterion (iv): to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- v. Criterion (v): to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- vi. Criterion (vi): To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.

Table 2.1: The list of UNESCO World Heritage mining sites and mining landscapes.

Mining site	Nomin ated (year)	Mining industry	OUV criterion	Natural and cultural criteria assessment
1. Wieliczka Salt Mine, Poland	(1978)	Salt	(iv)	<ul style="list-style-type: none"> Historic stages of the development of mining techniques in Europe from the 13th to the 20th centuries. The mines have hundreds of kilometres of galleries with works of art, underground chapels and statues sculpted in the salt, making a fascinating pilgrimage into the past.
2. Røros Mining Town and the Circumference, Norway	(1980)	Copper	(iii)(iv)(v)	<ul style="list-style-type: none"> Røros Mining Town comprises the mining town and its industrial-rural cultural landscapes. The site was traces of mining, smelters transport, and water management systems adaptation of technology regarding to natural environment requirements and the remoteness of the situation. This mining town constitutes an OUV of traditional settlement and land use. Many activities are carried accordance to this mining site.
3. Historic Town of Ouro Preto, Brazil	(1980)	Gold	(i)(iii)	<ul style="list-style-type: none"> A rugged landscape with the aesthetic eminence of vernacular and erudite architecture and irregular urban pattern of Ouro Preto. The

				<p>most famous architectural works are signified by the religious monuments and administrative buildings, including the Palácio dos Governadores (Governors' Palace), today the School of Mines, and the former Casa de Câmara e Cadeia (Administrative and Prison House), home to the Inconfidência Museum.</p> <ul style="list-style-type: none"> • Testimony to the creative talents of a society built on pioneering mining wealth under Portuguese colonial rule. Which is the representation of European art works: the architecture, paintings, and sculptures are based on underlying models introduced by Portuguese immigrants.
4. City of Potosí Bolivia	(1987)	Silver	(ii)(iv) (vi)	<ul style="list-style-type: none"> • The "Imperial City" of Potosí applied lasting influence on the development of architecture and monumental arts in the central region of the Andes by spreading the forms of a baroque style incorporating Indian influences. • It is the one example par excellence of a major silver mine in modern times. The industrial infrastructure comprised 22 lagunas or reservoirs, from which a forced flow of water produced the hydraulic power to activate the 140 ingenios or mills to grind silver ore. • OUV significance: the economic change brought about in the 16th century by the flood of Spanish currency resulting from the massive import of precious metals in Seville.
5. Neolithic Flint Mines at Spiennes (Mons) , Belgium	(1987)	Flint	(i)(iii) (iv)	<ul style="list-style-type: none"> • The Neolithic Flint Mines at Spiennes provided exceptional testimony to early human inventiveness and application. The arrival of the Neolithic cultures marked a major milestone in human cultural and technological development, which is vividly illustrated by the vast complex of ancient flint mines at Spiennes. It was the outstanding examples of the Neolithic mining of flint, which marked a seminal stage of human technological and cultural progress.
6. Historic Town of Guanajuato and Adjacent Mines, Mexico	(1988)	Silver	(i)(ii) (iv)(vi)	<ul style="list-style-type: none"> • Guanajuato: 190-hectare property contains the historic town, with Baroque and Neoclassical monuments and the silver mines. It was influence of Guanajuato was felt in the majority of the mining

				<p>towns of northern Mexico from the 16th to the 18th centuries.</p> <ul style="list-style-type: none"> • The outstanding example was architectural ensemble that incorporates the industrial and economic aspects of a mining operation. The major 18th century hydraulic works are intimately linked to an urban topography determined by the confines of the river path and mineral outcrops, so the Baroque buildings are directly linked to the wealth of the mines. • Historic Town of Guanajuato and Adjacent Mines is directly and tangibly associated with world economic history, particularly that of the 18th century.
7. Mines of Rammelsberg, Historic Town of Goslar and Upper Harz Water Management System, Germany	(1992)	Copper, lead and tin	(i)(ii) (iii)(iv)	<ul style="list-style-type: none"> • The ensemble is an outstanding example of human creative genius in the fields of mining techniques and industrial water-management. It's constitutes one of the largest mining and metallurgical complexes for non-ferrous metals in Europe. • Mines Rammelsberg, a historic town of Goslar and the Upper Harz Water-Management System reveals an important interchange of human values, in the field of mining and water management techniques, from the Middle Ages until the modern and contemporary periods in Europe. • It was an example of administrative and commercial organization in the middle Ages and the Renaissance period, through the remains of the monastery of Walkenried and the town planning of the Historic Town of Goslar.
8. Engelsberg Ironworks, Sweden	(1993)	Iron	(iv)	<ul style="list-style-type: none"> • Engelsberg is an outstanding example of the influential European industrial complex of the 17th-19th centuries with imperative technological remains and associated with the administrative and residential buildings intact. • It was the best preserved and most complete example of a Swedish iron-working estate, of the type which produced the superior grades of iron, using primitive smelting furnaces, which leading Sweden economic in the mining field for two centuries since the end of the Migration Period.

9. Historic Town of Banská Štiavnica and the Technical Monuments in its Vicinity, Slovakia	(1993)	Iron	(iv)(v)	<ul style="list-style-type: none"> • Its vicinity represents a unique symbiosis of the technical landscape and the urban environment resulting from its mineral wealth and the consequent prosperity that this engendered. • The silver-lead smelting plant, originating in the first half of the 17th century and modernized in 1872, is still extant, as is one of the buildings of the first factory in the world for producing machine-made wire cable.
10. Kutná Hora: Historical Town Centre with the Church of St Barbara and the Cathedral of Our Lady at Sedlec, Czech Republic	(1995)	Silver	(ii)(iv)	<ul style="list-style-type: none"> • Kutná Hora was one of the most important political and economic centres of Bohemia in the 14th and 15th centuries. Its medieval centre and the churches are outstanding examples of architectural development and testify to the cultural vivacity of the area. The influence of central Europe architectural.
11. Hallstatt-Dachstein / Salzkammergut Cultural Landscape, Austria	(1997)	Salt	(iii)(iv)	<ul style="list-style-type: none"> • Through salt mining process, a profound association between intensive human activities in the midst of a largely untamed landscape. The great beauty of natural landscape and scientific interest which evidenced of fundamental human economic activity of the salt extraction.
12. Las Médulas, Spain	(1997)	Gold	(i)(ii)(iii)(iv)	<ul style="list-style-type: none"> • Las Médulas gold-mining area is an outstanding example of innovative Roman technology, in which all the elements of the ancient landscape, both industrial and domestic, have survived to an exceptional degree. It provided exceptional evidence of a tradition of working and the technological and scientific exploitation of nature in a vanished civilization, which resulted in significant use of applied hydraulics. • Today its unique cultural landscape shaped by drastic human intervention and natural processes, with in addition the introduction of non-native flora, which has survived since the Roman period without change.
13. Historic Centre of the Town of Diamantina, Brazil	(1999)	Diamond	(ii)(iv)	<ul style="list-style-type: none"> • Historic centre of Diamantina adapted European models to an American context in the 18th century. • The urban and architectural group of Diamantina, perfectly integrated into a wild landscape, is a fine example

				of an adventurous spirit combined with a quest for refinement so typical of human nature.
14. Mining Area of the Great Copper Mountain in Falun, Sweden	(2000)	Copper	(ii)(iii)(v)	<ul style="list-style-type: none"> • Copper mining at Falun was influenced by German technology, but this was to become the major producer of copper in the 17th century and exercised a profound influence on mining technology in all parts of the world for two centuries. • The entire landscape influenced by the remains of copper mining and production, which began as early as the 9th century and came to an end in the closing years of the 20th century. • It has formed a “cottage industry”, to full industrial production evidenced by the abundant industrial, urban, and domestic remains characteristics.
15. Blaenavon Industrial Landscape, UK	(2000)	Iron and coal	(iii)(iv)	<ul style="list-style-type: none"> • Blaenavon is located in South Wales constitutes which is an exceptional illustration in material form of the social and economic structure of 19th century industry. • The Industrial Landscape components had created an outstanding and remarkably complete example of a 19th century industrial landscape with the mining facilities such as mines, railways, furnaces, workers’ houses and so forth.
16. Humberstone and Santa Laura Saltpetre Works, Chile	(2001)	Saltpetre	(ii)(iii)(iv)	<ul style="list-style-type: none"> • The development of the saltpetre industry reflects the combined knowledge, skills, technology, and financial investment of a diverse community of people who were brought together from around South America, and from Europe. The saltpetre mines and their associated company towns developed into an extensive and very distinct urban community with its own language, organisation, customs, and creative expressions, as well as displaying technical entrepreneurship. • It was the largest saltpetre in the world and transforming the Pampa and indirectly the agricultural lands that benefited from the fertilisers the works produced.
17. Historic Centre of the Town of Goiás, Brazil	(2001)	Gold	(ii)(iv)	<ul style="list-style-type: none"> • The architectural layout of the outstanding example of a European town admirably adapted to the

				<p>climatic, geographical and cultural constraints of central South America.</p> <ul style="list-style-type: none"> It was the evolution of a form of urban structure and architecture characteristic of the colonial settlement of South America, making full use of local materials and techniques and conserving its exceptional setting.
18. Zollverein Coal Mine Industrial Complex in Essen, Germany	(2001)	Coal	(ii)(iii)	<ul style="list-style-type: none"> Zollverein coal mine is an outstanding example of the application of the design concepts of the Modern Movement in architecture in a wholly industrial context. The technological and other structures of Zollverein XII are representative of a crucial period in the development of traditional heavy industries in Europe, which were reinforced through the parallel development and application of Modern Movement architectural designs of outstanding quality.
19. Sewell Mining Town, Chile	(2006)	Copper	(ii)	<ul style="list-style-type: none"> Sewell mining town reveals the global phenomenon of company towns, established in remote parts of the world through a fusion of local labour with resources from already industrialised nations, to mine and process high value copper. It was an example of mining town contributed to world the large-scale mining technology.
20. Cornwall and West Devon Mining Landscape, UK	(2006)	Copper, tin, zinc, lead and iron	(ii)(iii)(iv)	<ul style="list-style-type: none"> Cornish mining led to the evolution of an industrialised society manifest in the transformation of the landscape through the creation of smallholdings, railways, canals, docks and ports, and the creation or remodelling of towns and villages. Together these had a profound impact on the growth of industrialisation in the United Kingdom, and consequently on industrialised mining around the world. The extent and scope of the remains of copper and tin mining, and the associated transformation of the urban and rural landscapes presents a vivid and legible testimony to the success of Cornish and west Devon industrialised mining when the area dominated the world's output of copper, tin and arsenic. Its characteristic engine houses and

				beam engines as a technological ensemble in a landscape reflect the substantial contribution the area made to the Industrial Revolution and formative changes in mining practices around the world.
21. Iwami Ginzan Silver Mine and its Cultural Landscape, Japan	(2007)	Silver	(ii)(iii)(v)	<ul style="list-style-type: none"> • A significant commercial and cultural exchange between Japan and the trading countries of East Asia and Europe. • Technological developments in metal mining and production in Japan resulted in the evolution of a successful system based on small-scale, labour-intensive units covering the entire range of skills from digging to refining. • The relict landscape is the mines, smelting and refining sites, transportation routes, and port facilities virtually intact in the Iwami Ginzan Silver Mine Site.
22. Camino Real de Tierra Adentro, Mexico	(2010)	Silver	(ii)(iv)	<ul style="list-style-type: none"> • The Camino Real de Tierra Adentro became one of the most important routes to bond the Spanish Crown with its northern domains in the Americas. • Along the southern part of the route is a collection of sites related to work in mines and haciendas, merchant trading, military, evangelism and the administrative structure designed to control the immense territory from the Spanish metropolitan hub, adapted to the local environment, materials and technical practices, that reflect an outstanding interchange of cultural and religious ideas. • Buildings, architectural and technological ensembles, illustrate a significant stage in human history - the Spanish colonial exploitation of silver and the transformation of associated rural and urban landscapes.

23. Nord-Pas de Calais Mining Basin, France	(2012)	Coal	(ii)(iv)(vi)	<ul style="list-style-type: none"> • The extraction methods used for underground coal seams, the design of worker housing and urban planning, as well as the international human migration that accompanied the industrialization of Europe. • A large-scale development of coal mining in the 19th and 20th centuries structured by urban planning, specific industrial structures and the physical vestiges of coal extraction (slag heaps and subsidence). • The social, technical and cultural events associated with the history of the Mining Basin had international impacts.
24. Mining Sites of Wallonia, Belgium	(2012)	Coal	(ii)(iv)	<ul style="list-style-type: none"> • It is one of the most important sites of interculturalism arising out of mass industry through the participation of workers from other regions of Belgium, Europe and later Africa. • It reveals significant testimony to its industrial and technological components, its urban and architectural choices, and its social values, especially following the Bois-du-Cazier disaster (1956).
25. Sado gold mining, Niigata Prefecture, Japan. (Permanent Delegation of Japan to UNESCO)	(2010)	Gold	(ii)(iii)(iv)	<ul style="list-style-type: none"> • A series of pre-modern mining-related technologies and mine management system ranging from mining to smelting. • By introducing the very latest technologies from Japan and abroad, the Sado Mines served as the engine behind gold and silver production in Japan for more than four hundred years, and the series of mining technologies and mine management system developed there formed an important basis for the socio-economic systems of both the Edo shogunate and the Meiji government. • The landscapes formed by placer mining and surface mining around the Nishimikawa alluvial gold deposits and the Dôyû-no-warito outcrop as well as the group of modern mine sites. It's illustrated significant stages in human history in the area of mining technology during the early modern and modern periods.

(Source: Mining Sites & Landscapes on the UNESCO World Heritage List, retrieved from:
<http://mining.about.com/> and <http://whc.unesco.org/>)

2.4.1 The historic town and mining town (or mining settlement) in Malaysia

Malaysia is located in Southeast Asia region entails of Peninsular Malaysia and East Malaysia separated by the South China Sea. The extended land areas of this tropical country have the agglomeration of thirteen states and three federal territories (total 329,849 square kilometres) populated of by thirty million populations accordance to the census record in 2015. Malay Peninsula conceded as a Malay realm before the European colonials' occupation in Melaka since 1511s by the Portuguese and Dutch colonists. Come across to 18th century, British was the main colonial empire to conquest the politic and vibrancy economic of tin and rubber in the Malay States or Malaya before pre-war and independent by 1957s. In fact, the colonial influential has penetrated into Malaysia's historical town development and the fabrication of heritage urban landscape. The manifestation of historical cities or heritage sites in Malaysia inscribed on the UNESCO world heritage site designated of cultural heritage nominations is the Lenggong Valley Archaeological Heritage (2012) and the Melaka and George Town Historic Cities (2008). Besides the cultural heritage legacies, natural values of Gunung Mulu National Park and Kinabalu Park were admitted by UNESCO committee in the year 2000.

The character of a mining town or mining settlement is where the mining camp constructed along tin lodes on the west coastal of Malaya (Malaysia) (Ooi, 1963). Ooi (1963) also emphasised that most of the mining settlement has disappeared from the landscape after tin depleted and also destroyed by the flood on the existing mining site. Nonetheless, some of the mining camps were located scatter at the vicinity of mining fields and later developed into a centralised village settlement and an abiding township. That is how the small towns growth and rapid urbanisation phenomenon in the west regions of Malaysia (such as Ipoh, Taiping, Teluk Intan, Kampar, Batu Gajah and others) underwent direct impact from mining activities (Masron et al., 2012 and Yaacob et al., 2012). At the early period of mining industry before the British colonisation, Kohl (1978) described the tin miner lived in a dormitory surrounded by the jungle. The simple mining dormitory prepared by the Chinese mining company or explicated as 'Kongsis' or 'Kongsee' for the single tin labour who are contracted worker or free employed labour (ibid,1978). As described by Sunderland (2014), the size of miner house was huge, good ventilation supported by shafts structures, windows and higher 'attap' roof that made of 'nipah' palm leaf (Figure 2.2). Wong (1965) clarifies the newcomers worker or 'Sin-kheh' would be accommodated in an 'attap Kongsis-house', to set their work were and opened an employer book account to record the sum of the shared expense cost.



Figure 2.2: A typical Chinese miner dormitory covered by thatched roof and Malay bath shed situated at Kangsa River (left) and the Kongsis house of Ng Boon Bee's open cast mining in Kamunting, Larut (right) (Source: Bird, 1883:306 and Wright and Cartwright, 1908).

In general, the miner's dormitory interior spaces divided into the main hall positioned in the central part attached with two extension dormitories at both sides of the worker's living quarter. The lodging house provided to coolies as a place for resting, eating, conducted worship and a small reserved space for clerk and counter for bestowing opium and tobacco (Kohl, 1978:227). Besides, some indoor spaces of the miner quarter used to be an office for safekeeping accounts, storage for tin ore and mining utensils, and a kitchen (Sunderland, 2014). The miner slept on a wooden plank bed that raised about two feet high from the ground level, the bed covered with the grass mat without a mattress under the mosquito nets (ibid, 2014). Herein, the living amenities, daily food served (three meals per day) and the working hours of each mining worker depended on the mining company prosperity and rules.

The mining settlement was transient landscape with a temporary building, moulded ground landscape from the mining sand tailing, mining ponds, labour dormitory and the mining site (Ooi, 1963). Hence, the early unplanned mining camps contained scattered miner dwellings and all the houses were not in assembling in one mining territory. It was seemingly the mining landscape evidence the 'attap' thatch huts or miner dormitory dispersed from one mining site to another. Ooi (1963) also strengthens when the mining town fabricated; the mining settlement is pertaining as the foci Township closed to distance the mining site. The urban mining settlement also functions as a market centre for distributing and collecting merchandise, foods, crops, imported goods. In contrast, there is mining town positioned at the New Village during Communist Emergency, which located far from the mining site. At present, mining town was known as a historic town characterised by distinctiveness features, significance architectural characters, town arrangement, a historical backgrounds function as an administrative centre or commercial centre, as well as multiculturalism or religious area (Mohamed et al., 2001 and Shuhana, 2011).

2.5 The conception of cultural landscape in Malaysia

The characteristics of Cultural landscape in Malaysia mainly influenced by the socio-economic structure and different ethnic background (Abdullah, 2011). In his studies to reveal the relative attributes entails of geography, climate, cultural and socio-economic background, religion concerns are the distinctive physical and social element that characterising Malaysia's cultural landscape. Furthermore, there are six typologies cultural landscapes in Malaysia classified by Ahmad (2013) based on heritage landscape formation from different periods during pre-colonial period, under colonial occupation in Malaya, heritage landscape created after independence (Figure 2.3). The division of cultural landscape in Malaysia are the i) Rice landscape in Kedah; ii) plantation landscape; iii) coastal landscape of East Coast region; iv) coastal landscape in West Coast district; v) mixed farming landscape, and the vi) tea plantation landscape and mix-farming (Figure 2.4). By the understanding of Malaysian cultural landscape, the primary focus is to clarify the micro scale of early town growth and urban transformation since British colonial ruled. The industrial mining landscape (1874-1957) is not inclusion in Ahmad (2013) studies but it was crucial to point out the landuse in changed caused by tin industry in Malaysia. The testimony of mining cultural landscape was eventually influenced by the modification natural environment, economic and social impact via mining activity mentioned in Stuart (2012).

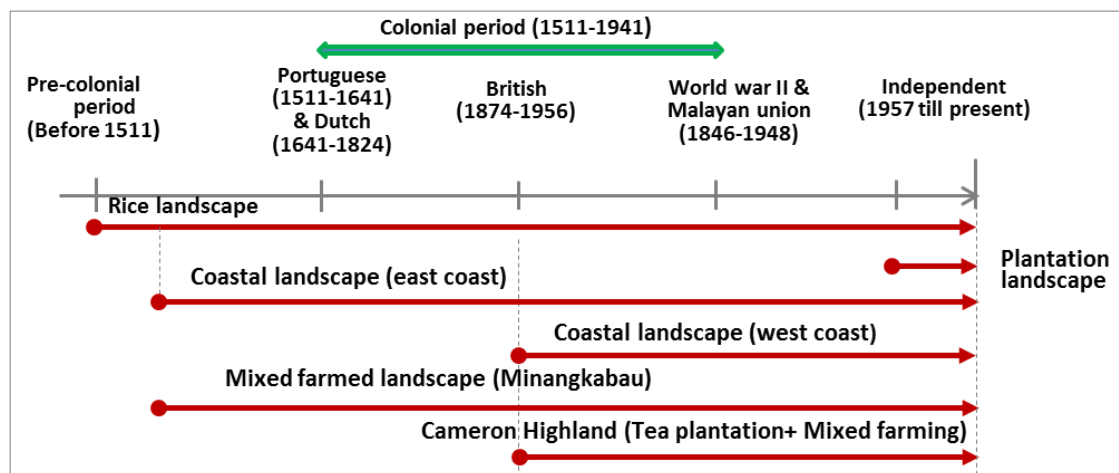


Figure 2.3: Historical timeline of cultural landscape in Malaysia (modified from Ahmad, 2013).



Figure 2.4: six categorisations of the rural cultural landscapes in Malaysia.

i. Rice landscape: Rice Paddy Landscape in Kedah.

The rural landscape of in Kedah is famous with the plain and river basins of the Merbok and Muda for paddy cultivation. The traditional way of rice plantation resembles an essentials part of Malay traditional lifestyle. Also, the layouts of paddy field, canals (river basin) and cluster of settlements portrays a scenic and historic significance of landscape rice landscape.

ii. Plantation landscape, FELDA Lurah Bilut

Lurah Bilut was the settlement of Malaysia's Federal Land Development Authority (FELDA). The first Malayan Five-Year Plan (1956-1960) established specific concentration on agricultural and rural development. The national policies had encouraged agricultural export and prevented rural poverty mainly the Malay community in the rural area. This plantation landscape provided job opportunity and improved the way of life for rural settled through modern facilities and services (MacAndrews, 1977).

iii. Coastal landscape (East Coast) : Terengganu traditional Village

The traditional fishing village in Terengganu was essential for local people livelihood based on fishing, agriculture and handicraft industries. The coastal landscape characterised by the village dwellings, traditional fishermen house, coastal vegetation

(coconut trees) and intangible traditions craftsmanship (boat making and fabric industry such as batik, songket and silk weaving).

iv. Coastal landscape (West Coast): Kuala Sepetang area

Kuala Sepetang was a unique fishing village located on the West Coast. Kuala Sepetang known as Port Weld, which is the former seaport connected Taiping for the tin export in the 19th century to Penang, Strait settlement via the first railway infrastructure constructed in 1885s. Besides, the coastal landscape of Kuala Sepetang related to mining industrial heritage and the early settlement of Chinese fisherman village (Sangga Island), it is also significance in the natural environment of mangrove forest. The mangrove forest was protected by Matang Forest reserved. The other commercial revenues in Kuala Sepetang were the charcoal factory and tourism.

v. Mixed Farming landscape: Minangkabau settlement Rembau and Kuala Pilah, Negeri Sembilan

The Minangkabau settlement in Rembau existed since the 16th century. The early settlement of Rembau and Kuala Pilah possessed distinct architecture of their traditional house with “peeked long roofs and fenced compound” to prevent cattle wandering into the house courtyards. This old village house is inherited by ‘Adat Perpatih’, particular clans in Negeri Sembilan. Therefore, the tangible architecture becomes a unique heritage to the mixed farming landscape of Minangkabau settlement.

vi. Mixed Farming landscape (Cameron Highlands)

British colonial began to build a retreat home or so called the hill station in 19th and 20th centuries. The hill station is known as a supreme home of a ‘little English’ for British administrators to spend their leisure and retreat from the heat weather in Malaya. Cameron Highland is one of the famous highland plantations of mix farming where the heritage agricultural landscape has developed since the 1920s. At present, the Cameron Highlands become a distinguish tea plantation, hotel cottages, rose garden, a golf course, and a boarding school initiated by British colonial in the 1930s.

2.6 Cultural heritage conservation

The historic town inscribed in Washington charter was an urban area built-up gradually and varied by local community through history (ICOMOS, 1897). The importance of historic town (or urban area) conservation is to preserve the tangible material and intangible (spiritual) of the historical character for both the natural and man-made environment by incorporated with the significant traditional urban cultures (ICOMOS, 1978). Moreover, UNESCO Recommendation (1976) elucidated historic area is refer to all prominent elements involves intangible human activities other than the buildings, the spatial organization, and its adjacent area (Jokilehto, 1990). A historic city deliberated as an urban area that entirely strengthens by the spirit of a place or genius loci, and yet the characters of a historic city mainly distinguish from a new city (Hutchison, 2010). The implication of a historic city possesses the innate identity to perform the historical values which is contrary to other cultural and countries (Ibid, 2010). Hence, a historic town remains the authentic tangible, and intangible historical and cultural significant is certifying to the cultural heritage safeguarding.

By understanding the meaning of cultural heritage consists of “monuments, groups of buildings and sites explicated by Ahmad (2006). Culture heritage is the pragmatic approach to signify the aesthetic, historical, scientific, social or spiritual value for the past, present or future generations recorded in Burra Charter (ICOMOS Australia, 1999:7). The connotation of cultural significant was notorious as the heritage significant or cultural heritage value (Ibid. 1999). The vitality of cultural heritage conservation contributed not only in remaining economic stability; enrich physical assets, but also to protect its practices, history, environment, and sense of continuity, belonging and identity (Jani et al., 2011). The conservation is crucial because, heritage epitomises “our legacy from the past, what we live with today, and pass on future generations” (Siririsak, & Akagawa, 2007).

In Malaysia, National Heritage Act 2005 is the impetus for the cultural heritage protection and preservation. Mustafa and Abdullah (2013) explained that the cultural heritage under the National Heritage Act specifically covers the heritage sites, heritage objects, underwater cultural heritage and intangible heritage (comprises the expression, sounds, and music, dances and performances) and the living heritage treasure. Besides, the cultural heritage or National Heritage inscribed in section 67 (2), the declaration criteria are about the ; a) historical importance and closed to Malaysian history; b) the good design or aesthetic characteristic; c) Scientific or technical innovations or achievements d) association with social and cultural; e) potential to educate Malaysian in cultural heritage; f) essential to exhibit a richness, diversity or unusual integration; g) rarity or uniqueness of the natural, tangible and

intangible cultural heritage; h) representative nature or object to the site; and i) any other matter than relevant to cultural heritage meaning (adopted in National Heritage Act, 2005).

As mentioned before, Malaysia's heritage conservation was organised in three tiers; from the national planning on federal level, regional or state level and the local authority (refer to National Plan Figure 2.5). All the related authorities manage to prepare the detailed framework, the development plan, the guidelines and the policies for the development plan and management. Although, there is no clear conservation legislation specific to conserve the industrial landscape in Malaysia, nonetheless the National Heritage Act is essential to protect the diversity of cultural heritage, as well as the heritage mining town.

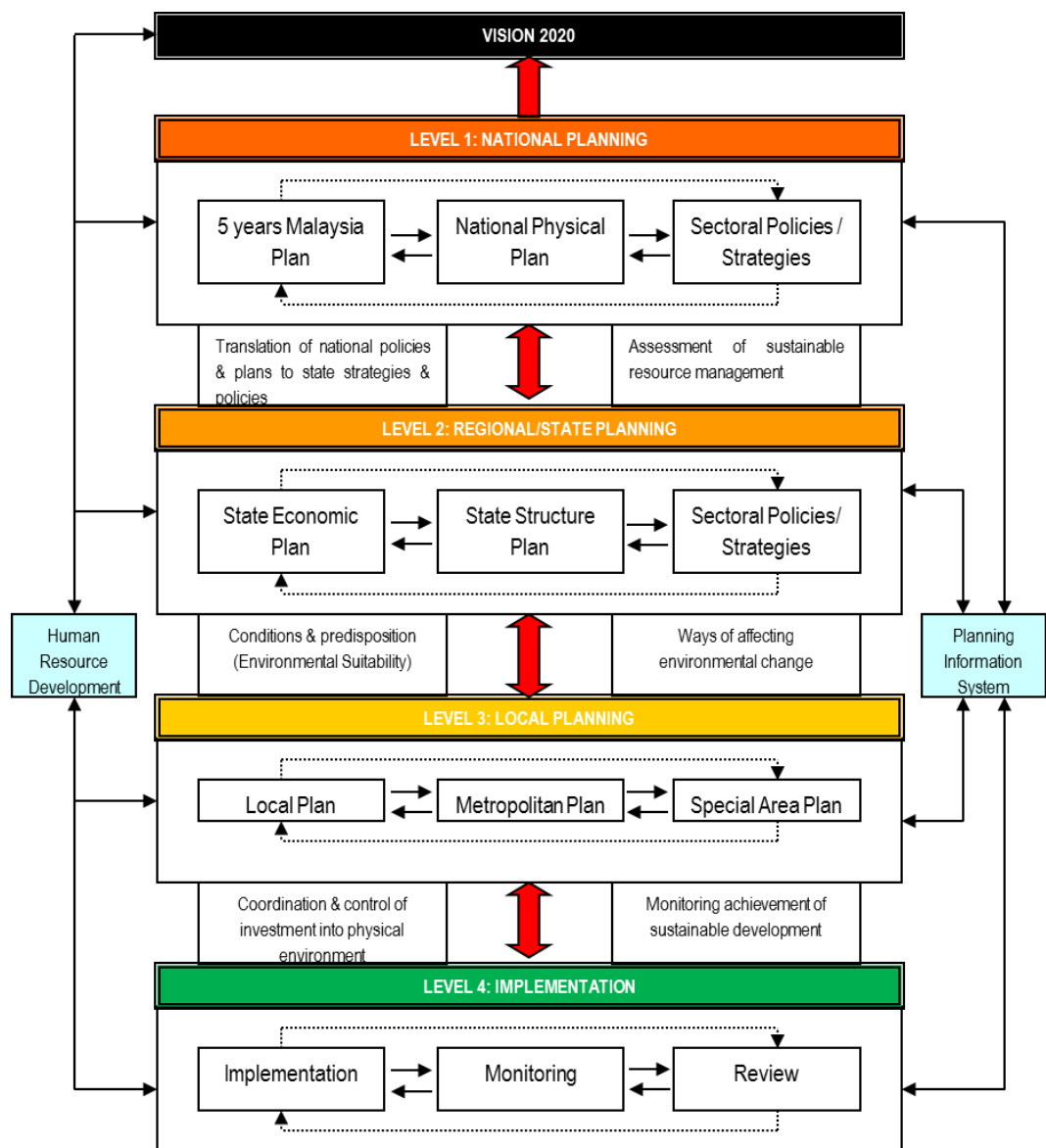


Figure 2.5: Integrated Resource Planning and Management System (Source: National Physical Plan in Zakiah (n.d))

2.6.1 Heritage conservation approaches

Table 2.2: Summary of heritage conservation approaches

Malaysia National Heritage Act 2005	The National Heritage Act (Act 645) received Royal Assent on 30 December 2005 and was published in the Gazette on 31 December 2005. This law came into effect on 1 March 2006.	<ol style="list-style-type: none"> 1) historical importance, relationship to Malaysian history; 2) good design or aesthetic characteristic; 3) Scientific or technical innovations or achievements 4) association with social and cultural; 5) potential to educate Malaysian in cultural heritage; 6) essential to exhibit a richness, diversity or unusual integration; 7) rarity or uniqueness of the natural, tangible and intangible cultural heritage; 8) representative nature or object to the site; and 9) Any others matter relevant to cultural heritage meaning.
Melaka and George Town historical site criteria	Northern and southern circuit of urbanisation, (Evers and Korff, 2000). The two urban circuits means the interrelation of urban economy development and labour power created.	<p>Outstanding Universal Values;</p> <ol style="list-style-type: none"> 1) Proven the succession of historical and cultural influences. 2) Criterion ii)-Melaka and George Town show a multicultural trading town of East and South East Asia. The mercantile trading interactions between Malay, Chinese and Indian cultures consecutive with European colonial powers almost 500 years, each imprints on architecture and urban form, technology and monumental art. 3) Criterion iii)-The multi-tangible and intangible heritage inheritance of Asian tradition and colonial influences. 4) Criterion iv)-created unique architectural, culture and townscape without parallel to any East and South Asia. There are the varieties of old shop houses and townhouses.
Taipei Declaration for Asian Industrial Heritage (TICCHI)	It was acknowledge by World Heritage Convention adopted by the World Heritage committee-Venice charter, ICOMOS and Nizhny Tangil.	<ol style="list-style-type: none"> 1) Beginning of the international heritage conservation due to rapid changes of urban expansion, land exploitation, population growth and industry structure. 2) Definition of industrial heritage in Asia should be extended in comprises of technologies, machinery, producing facilities, built structures and built environment of pre-industrial evolution and post industrial revolution periods. 3) Industrial heritage in Asia was a process of modernisation. 4) Interrelated to human cultural landscape either in urban or rural settings. 5) The essential elements of industrial heritage imported by western country or coloniser which are the factories, facilities, incorporating aesthetic

		<p>and scientific values should be preserved.</p> <p>6) The operational technology, associated archives documents, intangible heritage associated to local people must be preserved as well.</p> <p>7) Sustainable development on industrial heritage encouraged the adaptive-reuse to safeguarding on conservation.</p> <p>8) Encourage local people involvement in industrial heritage site conservation.</p>
ICOMOS the Burra Charter (1999)	The Burra Charter is probably the most significant document of the last thirty years on the basic principles and procedures for the conservation of heritage places. parts of the world	<p>1) The Burra Charter defines the basic principles and procedures to be followed in the conservation of heritage places. These principles and procedures can be applied to a monument, a courthouse, a garden, a shell midden, a rock art site, a cottage, a road, a mining or archaeological site, a whole district or a region.</p> <p>2) In 1979, the Australia <i>ICOMOS</i> charter for the conservation of places of cultural significance was adopted at a meeting at the historic mining town of Burra in South Australia.</p> <p>3) The cultural significance of a place is embodied in its physical material (fabric), its setting and its contents; in its use; in the associated documents; and in its meaning to people through their use and associations with the place.</p> <p>4) The cultural significance of a place, and other issues affecting its future, are best understood by a methodical process of collecting and analysing information before making decisions.</p>
Structural plan, Local plan and detail area plan.	Taiping Municipal council and State level.	<p>1) These plans are statutory plans as provided under the provisions of the Town and Country Planning Act 1976 (Act 172) These plans consist of maps and written statements, containing policies and proposals for the development and use of land in states or districts or any other area and addresses environment, social and economic development issues of the identified area.</p>

2.6.2 Malaysia's Non-Government Organisation on heritage conservation

In current Malaysia, the Non-Government Organisation (NGO) involved in the participatory of urban heritage conservation. For instance, the Penang Heritage Trust (PHT), Perak Heritage Society (PHS), and Taiping Heritage Society (THS) are the private organisations contributed in heritage management and implement the conservation of destroyed heritage site, improving and educate local people subtle to heritage conservation.

These NGOs group importance in safeguarding to protect state's (local) heritage. Perak Heritage Society (PHS) was established in 2003 and the objective of this society is to promote public awareness and the conservation and preservation of our social, environment and cultural heritage, for the benefit of all the people in Perak. In certainty, PHS deals with Perak state natural, cultural and industrial heritage (quote from <http://perkaheritage.wordpress.com/about-phs/>).

2.7 Colonialism and British colonial town planning

The urban history of Southeast Asian began after the European colonisation in the sixteenth century (Shaffer, 1996; Barwise and White, 2002 in Yuen, 2011). A Southeast Asian region was the virtual raw material suppliers and commercial commodities such as spices, tin ore, and agricultural productions. The striving of commercial trades and imperialisms through the western power of Portugal, Netherlands, Spain, Britain, France, and United States at various times have occupied and governed Southeast Asia excluded Thailand until the invasions of World War II by Japanese imperial army (Yuen, 2011: 147). Postcolonial cities refer predominantly to those cities existing in previously colonised societies (King, 2009:4). The postcolonial have foremost influences on economy, society, culture, religion, politics, spatial and built environments, and also security of the city (Ibid. 2009). British empire had increasingly penetration in Southeast Asia due to the western trade, investment, the strategic location with China trading, subsequent by the commencing Suez Canal in 1871, and the telegraph communication revolutionised since 1971 (Dixon, 1991).

The British colonial urban planning summarised by Home (1997) is referred to Lord Shaftesbury's Grand Modell circa 1670 (refer to the summary in Table 2.3). The primary British colonial urban landscape and building forms intended planned for the men (for white and non-white coloniser people) rather than women and families who had inadequate of public spaces consumption (Home, 2013). It had proven the spaces and built environment in a colonial town or city were the constitution of the "counting house and cantonment, the maidan (public square) and the padang, barrack and jute mill". Likewise, the urban form in a colonial city was also influenced by the social practice created by the natives or the multi-racial cultural that revealed to the pluralism landscape. The dominant physical form and the colonial urban landscape of a colonial city where the wide street typically designed in 100-150 feet for the main roads. The wide street was a social significance to the colonial cities of the purpose for surveillance, public health (to relieve smells and disease), to improve a town's ventilations where shades trees have planted on the wide street. Moreover, the urban fabric of Wide Street

in Calcutta, India unveiled the function for fire prevention, drainage system, amplified a city's majestic glory (Archer, 1994 cited in Home, 1997). Eventually, the racial segregation is one of the aspects of structuring the pattern of many colonial cities in which the separation of settlers and the native, and native from native mentioned by Home (2000). Hence, King (1989) discussed the problem of 'race, class and ethnicity and nation' dimension raised in the colonial urbanism and the development character of a global capitalist economy. For instance the impact of western colonialism caused to the problem of economic, politic and society manifested on the social hierarchy of 'Black Township' in South Africa and apartheid which is disconcerted (King, 1989).

British has colonised in the Malay States circa eighty-three years from 1874 up until Malaysia independent by 1957 (except Strait settlement that had occupied Penang and Georgetown in 1786). During the prompt urbanisation periods in between 19th and 20th centuries, Malay States evolved into modernisation. Moreover, the indirect and direct British rule and the economic expansions in the tin states of Federated Malay States brought to significant changes in Malaysia's urban landscape. Particularly, the colonial urbanism expansions in Malay Peninsula left the vast impacts on the town planning, colonial architecture, landscape, and the transportation technology on railway system). Other colonial townscapes encompasses the administrative building, facilities, recreational open spaces such as the 'padang' (esplanade), parade and playing field, old shophouses, school, post office, place of worship, military barracks, palaces, clock tower, prisons, government office, railways station, guest house and monuments formed a compact urban form in historic towns or cities (Mohamed et al., 2001; Lanegran, 2002; Ahmad Basri and Shuhana, 2008). The colonial heritage town functions as an urban centre for trading activity, living, and public facilities, social interaction.

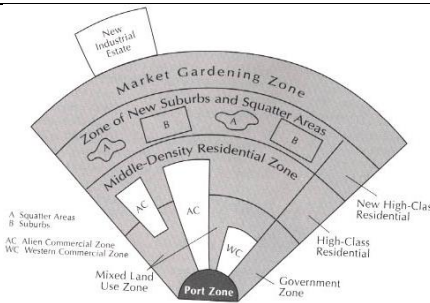
2.7.1 There are eight main determinant attributes of colonial urban planning listed by Home (1997) as stated below;

- i. Deliberate urbanisation as a locus for civil behaviour and to establish control.
- ii. Towns were pre-planned and imposed on localities without much attention being given to existing constraints.
- iii. Gridiron layout street.
- iv. Public squares are provided for symbolic purpose, to emphasise the status of the Empire. It was also used as cricket and civic gathering.
- v. Rectangular plots.













- vi. One tenth of the area of colonial town was laid out for public and sporting purposes.
- vii. A cordon sanitaire (a protective barrier) surrounded each town, about ¼ miles (400m) wide to separate town from surrounding bush or jungle.

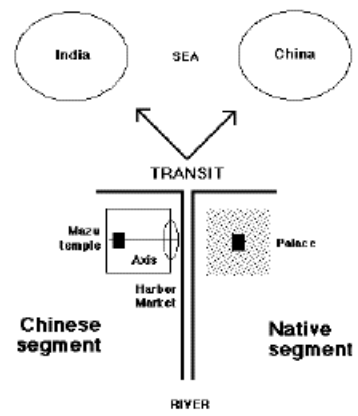
2.7.2 Theories of British colonial planning, Southeast Asia city, coastal port cities and plural society;

Table 2.3: Theories of British colonial planning

Theories	Characteristics and elements	Summary
Home (1997)	<p>Grand Modell (1670s by Lord Shaftesbury)</p> <p>The components of the British model of Colonial town Planning;</p> <ol style="list-style-type: none"> 1. A policy of deliberate urbanization, or town planting, in preference to dispersed settlement; 2. Land rights allocated in a combination of town, suburban and country lots; 3. The town planned and lay out in advance of settlement; 4. Wide streets laid out in geometric pattern, usually grid-iron form, usually on an area of one square mile; 5. Public squares; (Singapore maiden/Medan or esplanade/Padang, Dr.Lai) 6. standard-sized, rectangular plots, spacious in comparison with those in British towns of the time; 7. Some plots reserved for public purposes; and 8. A physical distinction between town and country, usually by common land or an encircling green belt. 	<p>Robert Home: the public square was one of the eight components of the standardised ‘grand model’ of British colonial settlement developed after the 17th century. Taken from (Lai, 2010).</p> <p>Colonial town planning: Urban built environment characteristic, industrial nation and revolution (colonial port, city, new machine, land surveying and infrastructure supplies), control land use, racial segregation (colonial urban form separation); public spaces and wide street used for controlling gaze / preserved for colonial surveillance; garden city model (or garden suburb model).</p>
McGee (1969)	<ol style="list-style-type: none"> 1. The aspects of land use distribution pattern are: <ul style="list-style-type: none"> • Old colonial port zone surrounded by a commercial business district (CBD). • No formal CBD • Hybrid sector and zone growing rapidly. • New industrial park at the 	 <p>Generalised diagram of the main</p>

	<p>outskirt of the city.</p> <ol style="list-style-type: none"> The alien commercial zone is dominated by Chinese (migrant from other part of Asia). They lived in the same building for their business. There is a separated area of the government zone. The focal point of the port zone reflecting a city orientation for export activities. High class residential zones located at the centre, middle class residential zones positioned in inner-city part. While the low income squatter dwell in periphery zone. A morphological analysis of Southeast Asian countries based on colonial imposition and western replication (McGee, 1976). 	<p>land use areas of the large Southeast Asian city. Developed by MC Gee in 1976s. http://www.lewishistoricalsociety.com)</p> <p>Two zones of land use in southeast Asian cities, in the large cities, the port associated of wharves and warehouses which was the economic activity centre of the city.</p>
King (1976)	<ol style="list-style-type: none"> Theory of colonial urban development. The common characteristics; <ul style="list-style-type: none"> Cultural contact between an industrialising or industrialised European colonial power and a traditional, agrarian or craft-based economy. Characterised by comparable spatial characteristics. Cultural pluralism Town planned developing into residential segregation. There are many cases occurred within the industrial societies for instances: problem of housing, shortage of economic resources, underdeveloped communication system, and lack of infrastructure to conduct with social, administrative and political needs. Social and spatial variables embodied the culture, technology and the power structure of colonialism. Example case study on the urban structure of Delhi, India. A conceptual framework for the study of colonial urbanisation follow the scale of global (macro), 	<ul style="list-style-type: none"> Socio-spatial structure in the colonial city is the indigenous settlement, modern western European colonial settlement. Many of the colonial town or cities consist of simple <i>twofold structure</i>. Or else the other third part occupied by migrants. Colonial third cultures in which selected element of metropolitan society were incorporated with local, indigenous element to form a different, third urban culture (Lai, 2010) The colonial third culture is resulted from the contact, in the colonised country, between the selected first cultural (metropolitan society suchlike British) and the selected second cultural (indigenous society). The 3rd colonial cultural like the centred rounded institutional system which comprehends ideational system, meaning, symbols, social structure, system relations and pattern of behaviour. (King, 1976:65) The component part of the colonial city: social-spatial structure of the colonial city,

	international / imperial (sub-macro); national (major: seaport/district/hill station etc.), urban (intermediate: colonial city); sector (minor) and unit (micro).	culture, technology and the power structure of colonialism.																																			
Yeoh, (1996)	The distinctiveness of colonial cities; <ol style="list-style-type: none">1. Colonial city as an ‘industrializing from expressing the transition between pre-industrial and industrial cities.2. Three specific features: “racial, cultural, social and religious pluralism used to distinguish the colonial city.” These social clusters of different societies retained their own behaviour, related traditions and customary practices (Yeoh, 1996:1). J.s Furnivall called it as ‘plural society’.3. Three main components of the colonial stratification system: the prime elite who are colonisers or the colonial settler who obtained the colonial power; the indigenous population and the immigrants. (taken from Horvath)4. The power of colonisation influenced on the social processes and the urban spatial structure.5. The ‘dualistic structural’ of colonial urban landscape shaped by the segregation European and indigenous settlement, economic activity, land use patterns and architectural style.	<ul style="list-style-type: none">● Built environment: Colonial city is often considered to be composed between traditionalism and modernisation. The modernise space such as western commercial centre, the port and the European suburbs, and consequently, the space existed only as the remnants of pre-colonial such as native bazaar or native sacred places.● Cross culture interactions: Colonial cultural influencing in the space making process. In Anthony D. King’s theory, there is important to transfer of European community cultural in shaping urban spaces such as cantonment, the bungalow compound, and the hill-station which is exemplified the idea of military, residential and social space in colonial society. (Ye SEG,oh, 1996:6)● A colonial city functions as peripheral of capitalism.● The formed and fabricated of the urban colonial landscape.																																			
Maria Alejandr a Lopez Conrado (n.d)	Transformation of the urban morphology in historic urban centre Case study: the city of Granada, Nicaragua <ol style="list-style-type: none">1. Initially, South East Asian built with a walled fort. The western style of commercial business district (CBD) segment developed according to entrepreneur of Chinese, Indian and European. Therefore, the commercial centre of Southeast Asian city centre was developed in the conception of ‘commercial centre’.2. Segregation policy of settlement is implemented which is to control the	<table><tr><th>Period</th><th>Urban Development</th><th>Urban Morphological Model</th><th>Concept</th><th>Symbol</th><th>Urban Growth</th><th>Architect Style</th></tr><tr><td>16th century</td><td>Early Colonial Period</td><td></td><td>Semi-circular around harbor and market place</td><td>Port and market</td><td>Natural</td><td>Medieval</td></tr><tr><td>17th century</td><td>1st Stage of Urbanization</td><td></td><td>Semi-circular with Military center</td><td>Port, large castle and fort</td><td>European immigration and rising commercial activities</td><td>Medieval</td></tr><tr><td>18th century</td><td>2nd Stage of Urbanization</td><td></td><td>Semi-circular expanded</td><td>Enlarged port</td><td>Racially segregated and controlled</td><td>Classical Neoclassical</td></tr><tr><td>Beginning of 20th century to present</td><td>3rd Stage of Urbanization</td><td></td><td>A more rational functional and economic principles and replaced racial principles</td><td>Business, residence, gardens, production, recreation and business parks</td><td>Rapid growth, development of population, commerce and industry</td><td>Modern Postmodern</td></tr></table> <p>References: Chinese, Indian, European, American, British, French, German, Italian, Japanese, Korean, Mexican, Russian, Spanish, Thai, Vietnamese, etc.</p> <p>Transformation of Asian city model (retrieved from: http://www.hues.kyushu-u.ac.jp/</p>	Period	Urban Development	Urban Morphological Model	Concept	Symbol	Urban Growth	Architect Style	16th century	Early Colonial Period		Semi-circular around harbor and market place	Port and market	Natural	Medieval	17th century	1st Stage of Urbanization		Semi-circular with Military center	Port, large castle and fort	European immigration and rising commercial activities	Medieval	18th century	2nd Stage of Urbanization		Semi-circular expanded	Enlarged port	Racially segregated and controlled	Classical Neoclassical	Beginning of 20th century to present	3rd Stage of Urbanization		A more rational functional and economic principles and replaced racial principles	Business, residence, gardens, production, recreation and business parks	Rapid growth, development of population, commerce and industry	Modern Postmodern
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	<p>economic roles of the urban population.</p> <p>3. At 20th century, modernisation process has taken place wherein more rational function and economic principle had replaced racial principle in the urban morphology.</p>	
Widodo (1996)	<p>The morphology pattern of Southeast Asian entrepot;</p> <ol style="list-style-type: none"> 1. Dominated by Chinese traders therefore the basic urban pattern of southern China Harbour area was the 'Mazu temple' (important indicator) to protect harbour and market area. (It was similar to Fujianese port cities in Southern China). 2. Later, the entrepot developed into bigger emporium for the local products exports. 3. The morphological of Southeast Asian emporium was dominated by the large royal city. 4. City wall built later (in 16th and 17th centuries) to defend from European attack. 5. The foreigner are not allowed to stay inside the wall therefore, they built a 'kampung' outside of the city walls. The kampong or village located closed to the river and the market. This village dwelling becomes an urban primary element of the trading city before the European arrival. It was usually a very dense settlement. 6. The settlement area sometime segregated according to different religions. The general group divisions were European, the Chinese, other foreigner and the native population. In ordinarily, the separation zones are not physically visible except the Chinese zone. 	 <p>The diagram illustrates the general model of an entrepot in Southeast Asia. At the top, 'India' and 'China' are shown in ovals, connected by a 'SEA'. Below them, a 'TRANSIT' point is marked with a downward arrow. A vertical line represents a 'RIVER'. To the left of the river is the 'Chinese segment', containing a 'Mazu temple' and a 'Harbor Market'. To the right is the 'Native segment', containing a 'Palace'. A horizontal line labeled 'Axis' runs through the 'Harbor Market' and 'Palace'.</p> <p>(General model of Entrepot in Southeast Asia)</p> <p>The main function of the coastal area was related to industry and international trade. Hence, other industrial formation such as shipyards, warehouse, and markets for commercial function.</p>
Huang (2002)	<p>Study area: Calcutta, Singapore, and Penang.</p> <p>The space structure of East India Company (EIC) port cities</p> <ol style="list-style-type: none"> 1. Defence (related to military defence) 2. Street pattern from disorder to order 3. Esplanade (an open space located at 	<p>Process of a colonial port city's mechanisms;</p> <p>namely defense → port → economic circulation → commerce → culture & education → entertainment</p>

	<p>the administrative or European residential area).</p> <p>4. Ethnically segregation housing (Calcutta: segregate dwelling between European and Indian; In Singapore and Penang: European, Chinese, Arabs, and Indian were lived in different places followed the adjacent street's name</p>	<ul style="list-style-type: none"> In 17th to 19th centuries, the British had implemented a segregationist policy in urban planning in their colonial cities. However, the ethnical segregation was not so obvious in Calcutta and Penang. Nevertheless, segregation was an open policy in Singapore, where the Europeans, Malays, Chinese, Bugis, and other ethnic group had their representatives in a council to plan for the urban structure (Lan Shinag, 2002:13).
Rex and Singh (2003)	<p>Plural society theories</p> <p>The new theory of race was founded on the idea that peoples were different not only in appearance and culture but also in inherent capacities or potential. (Charles Hirschman, 1987:568). Indian in the late 19th and early 20th centuries reveals a similar preoccupation with race, particularly in regard to caste classification (Indian, Census Commissioner 1893: chap5; Risley and Gait 1903:chap 11)</p>	

2.8 Conclusion remarks

The literature studies are to understand the universal cases of industrial mining landscapes and mining towns in the conceptions of heritage significance assessment and protection. Furthermore, the denotation of colonial town planning is to justify the establishment of a mining town and its townscape through the 'Grand Modell' (1670). The identification and evaluation of the colonial urban components derived from the British urban planning studies, Southeast Asia city model and the theory of the colonial town. Additionally, the literature covered the morphology of entrepot (port cities) pursue to the similarity and discern characters in between the urban structure of Southeast Asia city and the early inland mining town in Malaysia. Besides, interpretation of historic townscape studies to synchronise the relationships of a town's image and identity that symbolised by the physical aspect, socio-cultural, historical and morphology attributes. Through the townscape evaluations, a study on

the historic town's urban fabric is crucial to prolong a place significance or character towards the future heritage town conservation. Indeed, the mining town characteristics might have profound impacts of the historic townscape inherited by British colonial and the tin industry society.

Subsequently, Ahmad Radziah's (2013) study on the heritage of Malaysia's cultural landscape, she had categorised six typologies of the rural cultural landscape in Malaysia. In her findings, mining landscape in Malaysia is a lack of integrity whereas many mining sites have abandoned. Therefore the reason aforesaid, mining landscape was not categorised as one of the cultural landscape classification in Malaysia. Also, Ahmad (2013) conducted a workshop discussion in her research; the panel group unaware the former mining site like Sungai Lembing is undergoing heritage conservation. In another point of view, the historical evidence exposed the tin industry process and transformation in Malaysia. Wherein, although the various ex-mining lands had converted into new development (such as agricultural land, resort, housing estate and so on) but the ex-tin mining town is remaining as a concrete evidence to show the physical and social importance of a historic city and its heritage industrial landscape. In the 19th, British colonist had the greatest influenced on the early town development in Malaysia. Particularly it happened to the port city of Strait Settlement and the inland industrial tin mining town. These colonial towns influenced by the modification of western town planning, building architecture, English townscape and reserved open space for public usage inherited by the colonial town in Malaysia. Hence, the urban form and element are vitality to manifest the unique character of a colonial town.

Also, through the industrial heritage study (TICCIH's Nizhny Tagil Charter and Taipei Declaration for Asian Industrial Heritage) and the UNESCO world heritage industrial mining site or cultural landscape has recognised by the properties evidence of natural and cultural criterion inscribed in the Outstanding Universal Values. The listed criteria embrace the mining history, industrial transportation network, social infrastructure, port, industrial settlement, mining field, natural element and the ancillary industry related to the mining site. The entire industrial heritage is essential to indicate the evolution of the past and to justify the heritage values of an industrial site or a mining site. By looking at the industrial heritage conservation and the World Heritage Convention heritage approach had proposed an equivalent legislative protection and management of the recognised heritage significant site. In sum, the study of evolution of heritage mining town theoretical framework illustrated in Figure 2.6.

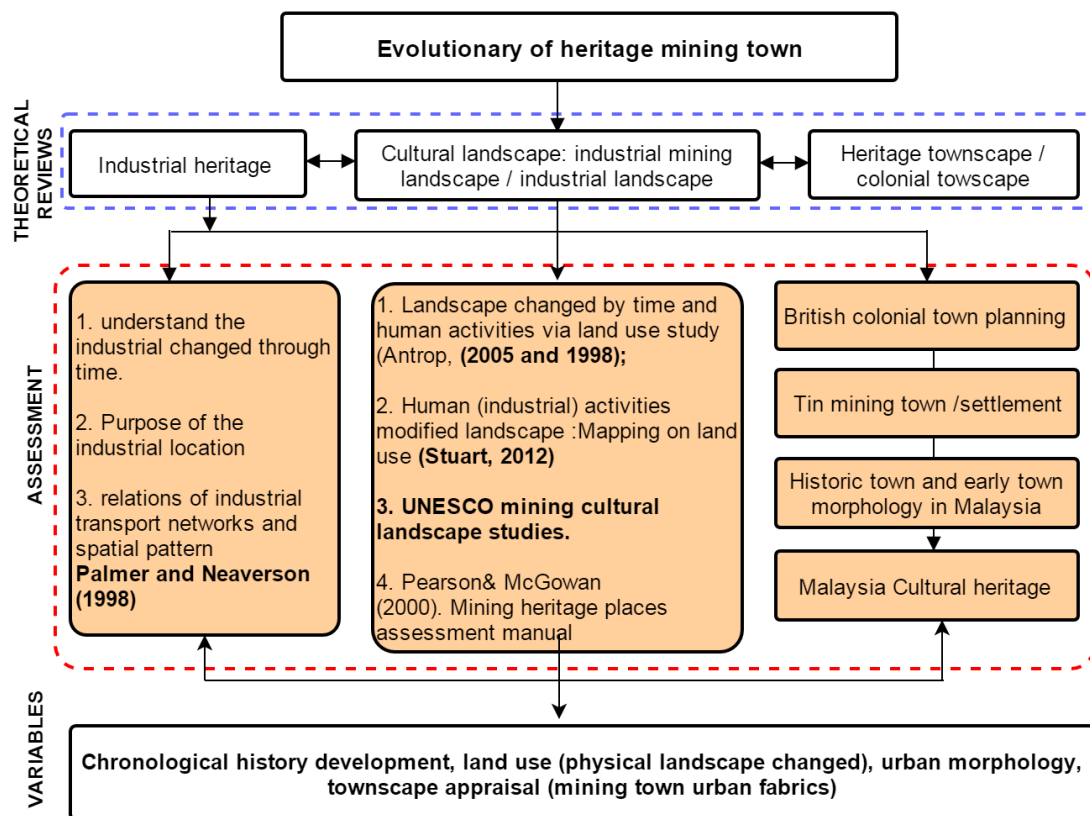


Figure 2.6: Theoretical framework.

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CHAPTER 3

PERSPECTIVE OF MINING TOWN AND LANDSCAPE IN MALAYSIA

3.0 Introduction

In this chapter three is divided into four parts of discussions to elucidate mining town in Malaysia context. The overview conceptions of the mining town in Malaysia treatise by the historic tin industry background of Malay Peninsula reciprocal with the tin mining techniques, mining technology, labour recruitment system, the post-colonial mining town and landscape formation. At the following section, the impacts of tin industrialisation will be discussed with the related factors on the importance of rapid small town urbanisation in Malaysia, tin industrial economic transformation, social infrastructure expansions and demographical changed because of the tin labour immigrated to Malay Peninsula. Also, the third part of this chapter is to discourse the divergence and convergence mining town characteristics of each former mining town located in Peninsula Malaysia. These tin towns selection comprises the richest tin ore productions in Kinta Valley district in Perak state comprises Ipoh, Gopeng, Papan, Kampar, Batu Gajah, Pusing and Tronoh. Sungai Lembing underground mine situated at East Coast of Malaysia selected into the extended discussion for the prototypes mining town. In such, it is important to scrutinise and comparative discussion the variant former tin towns and the unique features of mining landscapes. Hence, the virtual mining town characterising by the natural, historical tangible and intangible heritage such factors as the geography setting and land use pattern, industrial landscape attributes, and the influential social-cultural heritage from the tin industry. Concisely, the significance of cultural heritage and valuable mining town attributes of Malaysia's tin towns implies to the heritage conservation and historic town management. In sum, the final part of this chapter will deliberate the distinct aspect and typologies of the tin mining town in Malaysia.

3.1 Tin mining industry in Malaysia

3.1.1 Geographical setting and history background

Malay Peninsula located at the southernmost point of the Asian region with its areas 130,598 square kilometres (50,424 square miles). The geography landforms and physical settings of hill ranges are laid across from north to south found in the west-coastal of Malaysia. Kaur (1985) mentioned the central spine of hills forms the main watershed of Peninsula. He also described the early Malay settlements concentrated on the flat plains (river valley) and coastal area. Wong (1965) elucidated the precious tin mineral found at the foothills of mountain ranges composed of the granite. The predominant landscape formed by the ranges that shaped the alluvial tins fields. Bintang Range, Kledang Range, Benom Range (Main Range) and east coast's range are the vast highland landscape that runs through the whole Malay Peninsula. In fact, the sum of ninety percent Malaysia tin productions in is produced from the west tin belt (Ooi, 1963). So that, the natural topography and geography setting are essentials attribute constituted to the eastern and western tin lodes and the valley settlement was devised (refer to Figure 3.1). Yet, the tin belt layouts had determined types of mining technique and mining infrastructures improvising for each tin mining centre.



Figure 3.1: Location of tin mining sites in Perak, Selangor, Negeri Sembilan and Pahang in Malay Peninsula (Source: Yip, 1969, p.26).

Industrial Revolution in Europe and high tin demand has turned Malay States became a prominent tin exporter of Southeast Asian and international (Raja, 2015). Wong (1965) explicates Malaya was the primary tin productivity in the Malay Archipelago after the discovery of tin in Banka, India in 1711. Secondly, in the 19th century, the depression of Cornish tin in Britain yet at meanwhile the increased in demand for the tin fabrication for the tin plate (steel or iron coated) industry, pewter commodities and tin food canning (Ibid, 1965). The British colonial extended their economic imperialism and political power to monopoly the Malayan tin mining economics as well as the political ruler of each Malay States. Thereafter, the ‘strait tins’ virtually the same rate of English refined tin were produced in the Malay States and exported to a continental market. The early tin deposits mainly found in Perak, Selangor, Negeri Sembilan and Pahang state at Malay Peninsula (refer to Table 3.1). These important tin fields have the constitution in FMS’s political terrains. A brief recapitulation of political division on the tin protection States, British colonial has established the Federated Malay States (FMS) in 1895 during the British penetration into Malay States. Then, Kuala Lumpur was selected as the capital of Federated Malay States (Gullick, 1963).

Table 3.1: Tin mining site at Peninsular Malaysia

Phase of mining (year)	Phase one
1815s	Lukut, Negeri Sembilan
1827s	Pahang
1828s	Sungai Ujong, Negeri Sembilan. Terengganu
1830s	Batag Padang, Perak Petaling, Kuala Lumpur and Serdang, Selangor.
1840s	Phase Two
	Ampang, Ulu Langat, Ulu Selangor and Klang; Selangor Larut, Perak
1880s	Phase three
	Kinta, Perak (Batu Gajah, Chemor, Gopeng, Kampar, Kota Bharu & Malim Mawar, Kuala Dipang & Sg.Siput, Lahat & Pengkalan Pegoh, Menglembu, Papan, Pusing & Siputeh, Sungai Raia & Kampung Kepayang, Tambun & Ampang, Tanjong Rambutan, Tanjong Tualang and Tronoh.)

Source: Cheah (2001)

Malaya was listed the fourth-largest tin manufacturer in the world, it had become the largest tin producer by 1870s and 1880s (Kaur, 1985:154). Consequently, British governance had introduced the ‘residential system’ conducted by British advisory in law and order,

taxation and land codes in the wealthy tin Malay States (Palmer and Jolly, 2011). At the same time, the ‘State Land’ concept had implemented to sell or rent the land to foreign investors for both mining and agriculture. Malay processed the metallurgy of tins and refined in Singapore by the Chinese merchants (Hennart 1986:132). Sunderland (2014), Palmer and Joll (2011) interpreted that the raw material exported to Strait smelting company in Singapore, or the Eastern Smelting Company in Penang. Whereas, the slightly small amount tin sent to the Chinese smelting factory (such as the Tan Ban Joo Company at Pudu near Kuala Lumpur) and then exported in the form of block tin (Sunderland, 2004:75). Hence, the tin industry of Malay States catalyst tremendous growth when Straits tin began to replace Bangka and Cornish tin in the middle of 1860s. Likewise, Widodo (2004) states the opening of Suez Canal, the demands of world tin, the increasing of Chinese immigrant during tin rush era into Perak and Selangor Malay states are the primary causes to improve Penang’s economy in the mid-19th century. Ultimately, the tin economic had thriving Penang as the key tin export centre in British Malaya.

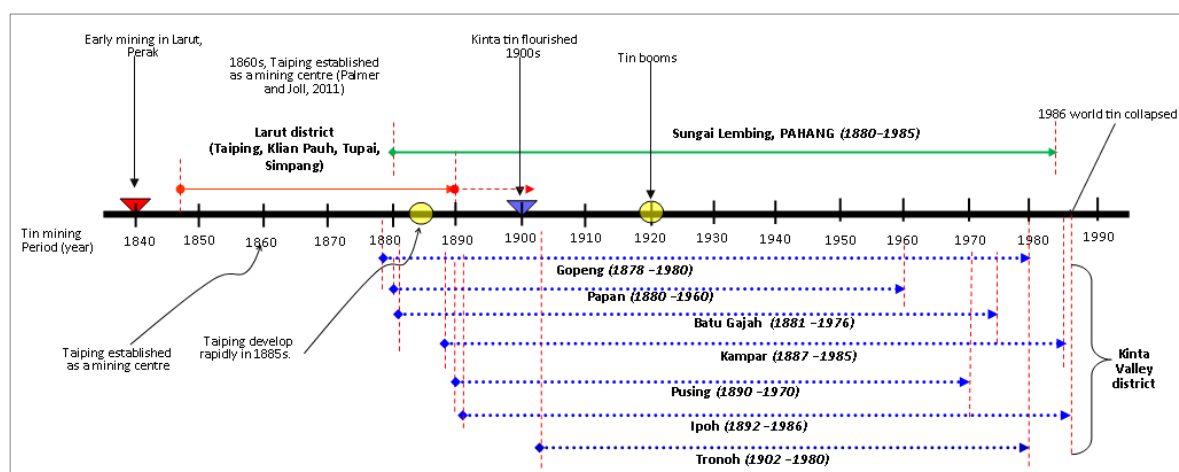


Figure 3.2 Chronology timeline of the tin productions and tin town growth in Larut District, Kinta Valley and Sungai Lembing (Author, 2015).

There are two important mining sites major contributed to Malaysia mining industry which is Larut (in 1840s), and Kinta Valley (1884) were located in Perak state. Figures 3.2 illustrated the chronology timeline of tin productions in another mining site of Malay States. Gullick (1963) mentioned tin deposit in the Malay States is commonly found in gravel or sand in alluvial deposits at the depth down to hundred feet or more below the surface”. In the early period of 19th century, Malay miners worked a small output of tin mining (Gullick, 1963). The Chinese tin entrepreneurs competed with the Malay small scale miner. Chinese mining technique implemented large opencast pits (namely the Chinese *lombongs*), this mining technique is more productive compare to the traditional manner using a flat wooden

tray (or *dulang*). Besides the Chinese mining, the encounter alluvial lands by Chinese merchants had begun their mines capitals in Malay States (Wong, 1965). Furthermore, Tetsuo (2009) also highlighted Chinese miners dominated the tin industry in the early period of 1870 to 1890. That is mainly because the British administrative and Chinese capitalist or ‘towkay’ carried out an intensive controlling on the tin mining process and labour employment system. Nonetheless, European mining enterprises successful compete with Chinese miners when they invented tin dredge to mine alluvial tin and less be contingent to the mine worker (Hennart, 1986; Tetsuo, 2009).

In 1895s, the world tin crisis turned slump and tin trading was suspended (King and Halib, 2008). By 1986, the tin market was not regained which erected to Malaysia tin mines and about 90 percent of the mining site had the shutdown (Ibid, 2008). Mining data recorded in 1970 exposed Perak state (71,394 hectares over total 158,968 hectares) possesses the highest ex-mining land in Peninsular Malaysia (Osman, 2013). At present, approximately 113,700 hectares tin tailings throughout in the Malaysia peninsula resulted from the tin mining activities (Ashraf, Mohd. and Yusoof, 2008). Ex-mining lands in Malaysia have further managed through planning guidelines prepared by the Federal Department of Town and Country Planning. The conversion of ex-mining lands or so-called brownfield into the mixed-development, recreational ground, agricultural land and embarks on the conservation research and heritage action (JPBD, 2010). Examples of ex-mining lands development listed as following Table 3.1. Nevertheless, the mining activities created many environmental issues. The environmental threats were related to the destructions of natural reserves, landscape changes, natural drainage damaging, pollution and destruction of natural habitats. The present ex-mining land conservation guidelines are: 1) brownfield redevelopment planning guideline and the environmental sensitive planning guidelines (Ibid, 2010: 16).

Table 3.2: Categories of re-use and redevelopment ex-mining lands in Malaysia;

Categories	Cases of reuse ex-mining land
i. Mix development	<p>Mine Resort City, Selangor: The world largest ex tin mining area, covering 1300 acres (including lakes). Mines Resort City applying the concept of mixed development of offices, shopping complexes, hotels, housing and recreation.</p> <p>Sunway City, Selangor: The 324-hectare township is truly integrated, having its own hospital, hotels, theme parks, shopping mall, medical Centre and two universities</p>
ii. Recreation	<p>Taiping Lake Garden, Perak It is the oldest public park in Malaysia, has been in use since 1884 and is located within the vicinity of Bukit Larut. Those mines have turned into lakes and gave the distinct characteristics to the Lake Garden. These lakes play a pivotal role in sustaining the city and act as water retention</p>

	<p>Zones that prevent flash floods in Taiping.</p> <p>Lake Garden, Kuala Lumpur (<i>Taman Tasik Perdana</i>) This park is built on the 92 hectares of undulating mining site. This park was officially opened on May 1, 1975 by the second Prime Minister of Malaysia Tun Haji Abdul Razak Hussein.</p> <p>Paya Indah Wetland, Selangor Located in Kuala Langat District in the State of Selangor, Paya Indah Wetlands covers an area of 3,100 hectares, incorporating a myriad of ecosystems, namely degraded ex-tin mining land and peat swamp forest.</p>
iii. Golf resort	<p>Clearwater Sanctuary Golf Resort, Perak It was a former tin mine surrounded by seven manmade lakes with beautiful scenery. An area of 739 acres have been redeveloped in 1994 includes the golf course with 6,482 square meters and par 72.</p>
iv. Residential	<p>Lake Fields, Sungai Besi An ex-mining lake transformed into three-storey terraced houses adjacent to the five-star Palace of the Golden Horses Hotel.</p> <p>Kampar, Perak A former mine site has been developed into business centre, housing, education (UTAR university), various facilities, infrastructure and services.</p>
v. Agriculture and farming	<p>Bidor agricultural activity is done in an ex-mining area which has been reclaimed for agriculture.</p> <p>Tambun is also well known pomelo plantation area of 60 hectares as well as an ecotourism area.</p> <p>Fish farming in Perak ex-mining ponds computation to 307 of ponds with 1,394.48 hectares.</p>
vi. Retention Ponds (Integrated Storm Water Management)	<p>Project at Kinta District, Ipoh: rehabilitation of ex-mining ponds covers an area of 88 acres and generally divided into several categories which include open spaces, ponds, earth drains and also wetland or swampy area.</p>

(Source: JPBD, 2010)

3.1.2 The mining method and technology

The prevalent surface mining method in Malaysia influenced by tropical local weather where the concealed alluvial ore excavated by a simple mining technique using water and wooden sluice box or 'palong' (Mohamad and Hassan, 1996). Each tin mining era was essential to demonstrate the evolution of mining techniques derived from the primitive skills or labour workforce tin collections till the introducing of new mining technology by the British colonist. Jackson (1963:105) classified the initial Malay mining period started in the 1820s, before the Chinese coolies flocked to work in Malayan tin mines by 1850s. In between the periods of 1850 to 1880, the pioneering Capitan or 'Kapitan' was the Chinese overseas leader that engaged in Malayan tin mining system and tin trades. Until the revival

tin era in Kinta (1880 to 1905), the development of innovative mining mechanisation arose when the arrival of tin dredging from 1920 and endures to present. Therefore, in the early 20th century, the amplified energy fuels requested such as diesel and electricity power were to generate tin mining operations. The following table 3.3 exemplified the distinct periods of tin mining history in Malaysia.

Table 3.3: The historic trend of mining method in Malaysia (1800 to 2000)

Method Mining	Year				
	1800-1840	1850-1890	1900-1940	1950-1990	2000
Ancestral					
Open cast / <i>lombong</i>					
Hydraulic					
Gravel pump					
Bucket ladder dredging					
Underground mining					
Power					
Steam (Charcoal)					
Diesel					
Electricity					

(Source: Palmer and Joll, 2011:205)

In a nutshell, to be summarised the Chinese open-cast mining, gravel pump and bucket ladder dredging provided the highest volumes of tin metal which contributed 83.2 percent of annually tin outputs from 1800 to 2000 (refer to Table 3.4). In the middle of 19th century, the preference of Chinese hand open-cast mining method because of the cheap labour cost, the involvement of Chinese merchants established in the Strait Settlements and the systematic of Chinese organisation in handling the surface alluvial mines. In fact, the undertaken mechanical methods for gravel pump and tin dredging showed the significant increment of the tin productions compare to hydraulic mining.

Table 3.4: Appraisal of tin production by mining method (tonnes of tin metal) 1800-2000

Method Mining	1801 - 1850	1851- 1900	1901- 1950	1951- 2000	Total	Percentage
Ancestral	190,000	120,000	5,000	0	315,000	5.5
Open cast / <i>lombong</i>	27,000	719,000	861,000	0	1,607,000	28
Hydraulic	0	8,000	124,000	18,000	150,000	2.6
Gravel pump	0	0	550,000	1,107,000	1,657,500	28.9
Bucket ladder dredging	0	0	599,000	912,000	1,511,000	26.3

Other	0	5,000	177,000	318,000	500000	8.7
Total	217,000	852,000	2,316,000	2,355,000	5,740,000	100 %
Total percentage (%)	3.8	14.8	40.4	14.0	100 %	

(Source: Palmer and Joll, 2011:207)

i. Dulang washing or panning

Dulang washing was a small scale, family-based mines which are mainly engaged by female labour. The lighter sand particles were washed over the edge of the dulang while tin ore remained at the bottom. The dulang washers normally sold their products to the larger mines (King and Halib, 2008:29). This small Dulang washing mining method is important wherein nearly 150,000 tonnes of tin concentrates had produced or over 2% of the total tin production in Malaysia (Palmer and Joll, 2011).

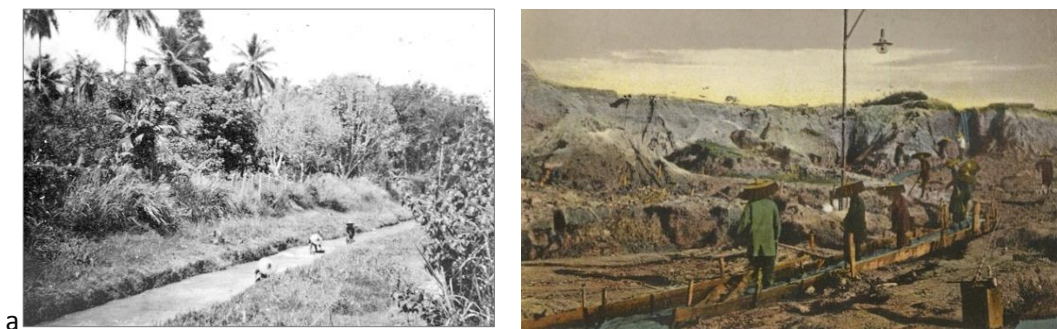


Figure 3.3: The dulang washers worked at the river side (left) and the woman dulang washer reaped as open-cast mines gleaners.

(Source: <http://www.ipohworld.org/2011/10/14/dulang-washers/> and Lubis, Wade and Khoo, 2010).

ii. Opencast mining method or *lombong*

In the early phase of opencast mining mainly worked by manual labour for both ground diggings and mine hole dewatering (Hew, 1981). There had been Chinese labour operated on Perak mines since the late eighteenth century (Gullick, 2010:32). Henceforth, the open cast mining consisted removing and excavating by using hoe before brought the ore-bearing ground up to the ground surface (Lubis, Wade and Khoo, 2010). Moreover, the Chinese opencast mining impending to the clear-cutting primary forest is for mines expansion. Some Chinese also dug the large opencast pits (*lombong*), dewatered their mines with a waterwheel (*kincir*) driven by the force of a stream which lifted water to ground level and discharged it into a wooden gutter.

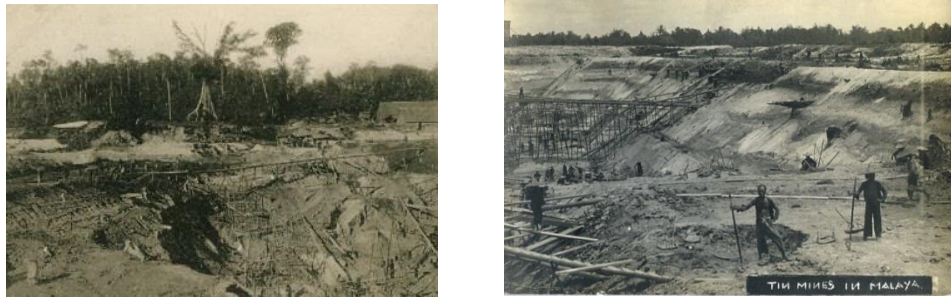


Figure 3.4: The forest clearance and cutting ground by the coolies (left) and the light timber structure gangway to ease the coolies carried tin-bearing gravel from pit to surface (Source: Lubis, Wade and Khoo, 2010).

iii. Hydraulic mining

Hydraulic mining introduced by English Engineer, it is suitable for the mining land closed to the water supply that can flow under pressure to the mining site (Palmer and Joll, 2011). Kinta Valley mines are practical for hydraulic mining technique due to the large volumes of water source divert from the Main Range to Kinta River especially during the monsoon period. The high water pressure (over 150 psi, a unit of pressure) used to disintegrate the solid ground and earth cutting and excavation are more effective than the open cast mining that only limited to certain ground depth. Palmer and Joll (2011:229) stress the 150 psi effort to cut down 7,5000 m³/ month of ground equal to approximate fifty to hundred Chinese workforces with their hoe. By 1890s, Osborne and Chappel mining company was first adopted hydraulic mining at Leh Chin mine. The hydraulic mining was operative in several mining sites of Kinta district such as Tambun, Gopeng and Kampar (Figure 3.5). In the 1920s, this mining technique was popular cope with the Chinese mining ground by utilised gravel pump (Lubis, Wade and Khoo, 2010).

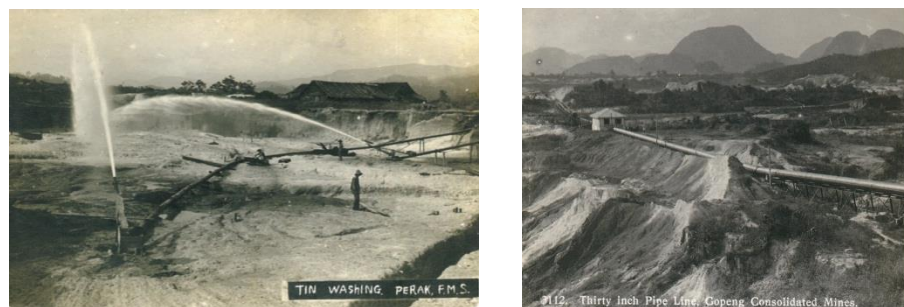


Figure 3.5: The water jets are used for the ground breaking worked by few tin labours (left) and the mining landscape scene created by the metal pipelines

constructed by Gopeng Consolidated Limited for the water pressure for hydraulic mining at Gopeng (Source: Lubis, Wade and Khoo, 2010).

iv. Gravel pump and the bucket dredge

The principle of alluvial mining technique enables to operate by gravel pump or the Chinese lombongs, hydraulic mining, and the bucket ladder dredge. Gravel pump was a famous mining technique in Malaysia to produce over half of annual output (Mohamad and Hassan, 1996). Certainly, the popularity of gravel pump mining in Malaysia is because of the cheap operational cost and effective for placer mining or alluvial tin ore (Yap, 2006). Gravel pump mining was the common method of extracting the alluvial tin deposits in the low-lying Kinta Valley (King and Halib, 2008). This mining technique is not pragmatic operating at the area of many boulders (Yap, 2006). Chinese open cast mining method leaves over a history memory of influxes Chinese immigrant labours to work in Malaya's mines. Chinese miners initiated to use mechanical pump system to decrease the mining labour force in early 1900s (Palmer and Joll, 2011) (Figure 3.6).



Figure 3.6: Gravel pump mining technique operated with pipelines and pump house at one of the mining site near to Ipoh in Kinta Valley district (Source: Yip, 1969).

Gullick (1963) described that the first tin dredge in the Malay States operated circa 1912-1914. Malayan Tin Dredging Ltd possessed the first tin dredge executed at Batu Gajah (Palmer and Joll, 2011). The bucket dredge entails of bucket chain mounted on a steel or wooden pontoon so that the heavy metal dredge could float in the swampy or lowland mine (Figure 3.7). The tin dredge was operating when tin deposits were mechanically scooped up from mining ground by the buckets and inflow inside a trammel wherein the water pressure successively breaks down the tin metals and send into series of sluices in which the tin concentrated (Lubis, Wade and Khoo, 2010:300). This modern mining machine seemly for

European sectors that not needed mine labours but mainly capital intensive in mining. The advantages of bucket ladder dredge were low running cost for mass mining manoeuvre, able to operate within 24 hours and suitable for lowland and swampy ground (Palmer and Jol, 2011).

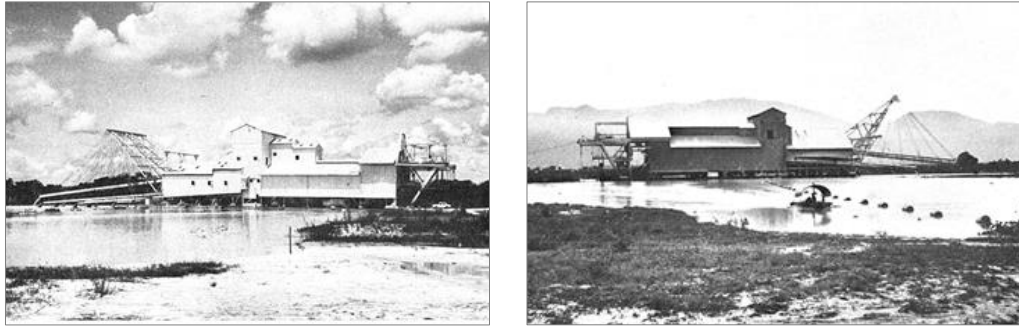


Figure 3.7: A station of tin dredge in 250 feet long and 65 feet wide capable in excavating a 105 feet mining ground (left); one of the Malaysia largest tin dredge first manufactured in 1940 able digging to a depth of 130 feet (Source: Yip, 1969).

3.1.3 Tin mining enterprise and labour system

The Chinese and European mining enterprises have established the tin mining industry structure of Malaysia. Both mining sectors recruited diverse commercial approaches in the development of Malaysia mining industry that produced 5.74 million tonnes of tin ores during 19th and 20th centuries (Palmer and Joll, 2011). The Chinese mining company explicated as ‘Kongsis’ or ‘Kongsee’ had monopoly tin mining operation in the early of 19th century. The Chinese Kongsis accomplished mining trade through their family business and partnership while the European enterprise exclusively operates with tin Corporation (Palmer and Joll, 2011). Also, the Chinese company was competent in conducting tin mining operations whereas the European entrepreneur was precedence over the mining investment (ibid, 2011). Wong (1965) intensifies Chinese miners make a compliment of water-course, constructing Kongsis house and discover new mining lands. The British colonial cum Western corporate adversely developed Mining Township and the capital equipment of mining technologies. In the nutshell, each mining sector exploited in different mining methods and trading principles but in between some are overlaps. For instance, Mr. Chung Thye Phin has applied modern western hydraulic pipelines for Yong Phin mine proximate to Taiping by cutting one thousand cubic yards mining ground equivalent of the five hundred tin labours’ working load (Wright and Cartwright, 1908).

Nevertheless, come to the mid of 20th century, the expansion of Western tin enterprises in the Malay States began to contend with the Chinese company. The quantity of European's tin output began steadily increased from 1927 (41 percent of tin production) to 1929 (61 percent of tin outputs) (refer to Figure 3.8). In the 1930s, the Chinese company only produced 37 percent tin deposits and meantime the European capital manufactured 63 percent of tin productions. Moreover, the European enterprise had led the tin mining trade till the post-wars period and eventually to attain 66 percent of tin metal production by 1937. Sunderland (2014) fortifies Chinese mines do not radically decreasing although the percentage of tin outputs were progressively reduced in late the 1900s. Undeniably, the Chinese and European miners respectively had contributed to tin manufacturing and exportation from Malaya. The comparative factors of Chinese and European companies expounded in Table 3.5.

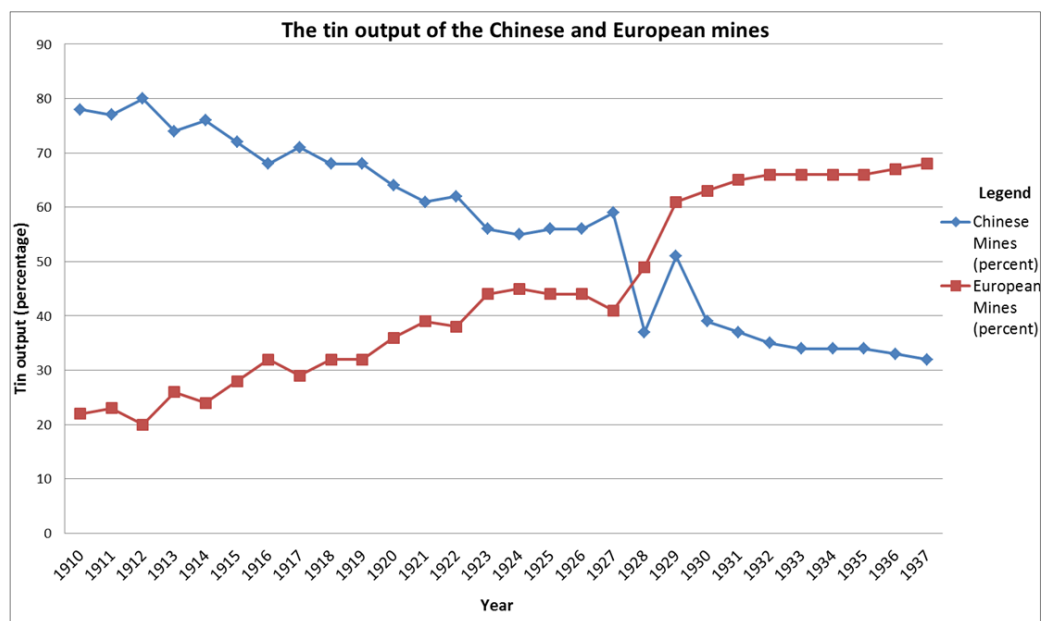


Figure 3.8: Tin output of the Chinese and European mines from 1910 to 1937 (Source: Sunderland,2014:83).

Table 3.5: Comparative of the Chinese and European mining companies in the Malay States.

Chinese miner or 'Kongsee'	European company
<ul style="list-style-type: none"> Simple and primitive mining method and equipment; manual labour, and ability of hard sustain work. The whole mining process was operated using hoe (<i>changkul</i>), washing box and chain pump generated by water wheel or treadmill toiled by man. Chinese mining was economic and 	<ul style="list-style-type: none"> It was much costly of hiring the European employee plus the expensive mining equipment, and heavy payments for corporate (Chai, 1964:164-165).

technological limited. (Wong, 1965)	
<ul style="list-style-type: none"> Chinese mining conducted in small scale, systematic and the efficiency of Chinese mining in handling hillside and plains mining, otherwise it was depends on the types of tin deposits. 	<ul style="list-style-type: none"> European capital using the advance tin dredge which is proficient to deal with the depth tin bearing alluvium and suitable for mass productions.
<ul style="list-style-type: none"> Chinese mining conducted since 1800 to 1929. By 1880s, Chinese company dominated Perak mines which achieved 978 of registered mining site entail of 16,000 acres (including 233 leased mines by Malay chief to Chinese miner via tribute system) (Chai, 1964:164) . The famous Chinese mining tycoons are: Yong Phin Mine (Chung Ah Yong); Chung Thye Phin mine at Tronoh, Ng Boon Bee's open cast mine at Kamunting (Wright and Cartwright, 1908). 	<ul style="list-style-type: none"> European mines began by Gopeng Tin Mining Company and the office based in Redruth, Cornwall, UK (Palmer and Joll, 2011). The other registered company such as Tekka Taiping Limited (1913), Tekka Limited (1907), Kinta Tin Mines Limited (1900) and so forth. The smelting company was dominated by European firm.

3.2 Impacts of tin industrialisation in Malay States

The following four influences factors discuss the impacts of tin industry development in Malay States. Malaya tin industrialisation led to the rapid growth of small town, economic transformation, infrastructure and facilities expansion and population promptly increased. The evolutions process of tin mining town became the historical importance for the early town establishment in Malaysia.

3.2.1 Rapid urbanisation in Malaya: small towns' development

In 1840, tin ore discovered at the foothills of the west region in Malay Peninsula, wherein the transition from river mouth settlements into the hinterland development (Kaur, 1985). The urban growth and vicinity towns' transformation at Malay States further accelerated by the tin booms and agricultural developments in 19th century (Lees, 2009; Lees, 2011). Lees (2011) exposed the demographic in 1921 summed up 27.7 percent of 'British Malaya' inclusions the Federated Malay States and Strait Settlements are urban settlers. Lees (2009:83) also highlighted the expansion of west coast townships such Kuala Lumpur, Ipoh and Taiping to pertain as an important commercial centre, enclosed by the

high density settlements and a multiple linkages system for interchange and communication. The influxes of immigrant tin workers were increasing the numbers of small towns that had transformed the mining camp into tin settlement. As the result, Sidhu (1976:18) explained some of the mining village grown into a town emerged as a service centre for the rural area. Literally, the demographic census of Federated Malay States and Strait settlements enormously changed in 1921 when the recorded 27.7% population were settled in urban area (Lees, 2011).

3.2.2 Economic transformation

The intricate conflicts and chaos among Chinese miners from different clans and secret societies (Gee Hin and Hai San) instigated British intervention to the inner politic of Larut in Perak. This incident manifested the beginning of political economy transformation in Perak (Abdullah et al., 2012). Simultaneously, Kaur (1985) expounds British intrusions in Perak, Selangor and Sungai Ujong in 1874 due to the inauguration's Suez Canal. Hence, British have executed 'Resident system' whereas the British official administrative was extended to other Malay states in Negeri Sembilan and Pahang because of the tin possessions (Ibid, 1985). Subsequently, aforementioned the tin prosperous Malay States were reunited as Federated Malay States (FMS) in 1896 (refer to Figure 3.9). In particular, the FMS or tin regions of Malay States administered by British Resident's legislations and protection. The tin economics flourishing in the Malay States directed to a colonial's political system, and capitalism economy are strengthened by British (Abdullah et al., 2012). On the other hand, the British system exposed disadvantages for local chieftains to dominate tin economics structure in the Malay States.

The economic pattern of Malay States radically transformed because of the high tin demands. As Abdullah et al. (2012) stated the Malay States became one of the world tin producers and in the meantime, the tin industry wanted settler tin workers and mining technology. By 1850, the Malayan tin was reckoned as "Straits tin" was exported to China, India and subsequently to UK in 1865 when the tinplate industry increased in Britain (Yamada, 1971 and Henart, 1986). Therefore, the major government returns was formulated from the tin export taxes and foreign direct investment. Yip (1969:13) reported Malaya tin economic revenues had contributed by the overall export duty constitutes of one-third to one-half of the entire profits of FMS in between 1880 and 1905.



Figure 3.9: Federated Malay States (FMS) establishment in early 1909s. (Source: retrieved from <http://asiapacific.anu.edu.au/maponline/base-maps/states-malaya-1909>; CartoGIS, College of Asia and the Pacific, The Australian National University as the source of the maps. at 30 June 2014).

3.2.3 Social infrastructure and facilities expansions

The railway communications expansions in Malay Peninsula are owing to the tin industry development in between 19th and 20th centuries. Railway tracks are built proximity to each mining town centre and ended to the seaport terminus. The inevitable to construct railway was encouraged at the commenced tin industry due to the limitation of transportation alternatives at that time and the constraint factors of consuming bullock cart services (cart-track) and riverine (Leinbach, 1975 and Kaur, 1980). Moreover, the railroad services not only to serve for tin trades but also utilised to conveyance crops plant when tin ore depleted. Rubbers economic boom have substituted tin aggregates as the traded commodities. Subsequently, in the 1910s, the railway direction was extended to the North-South rail network from the tin mining town to the inbound rubber estates in Malaya Sates (illustrated in Figure 3.10). The transportation infrastructures were primarily linking the mining towns concentrated on the West Coast of Malay Peninsula (Kaur, 1985). Thus, the main seaport such as Port Weld, Telok Anson and Port Swettenham are located at the west coastal where the tin lodes position (Figure 3.11).

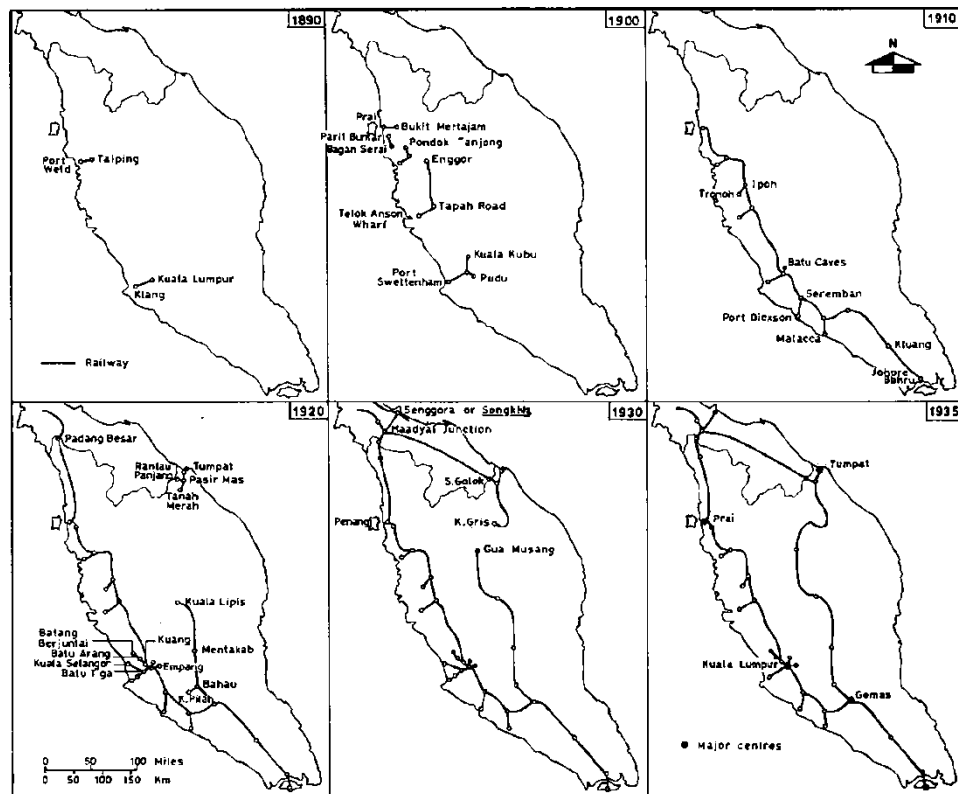


Figure 3.10: Evolutions development of Malayan Railway system in 1885-1935 (Source: Kaur, 1985:75).

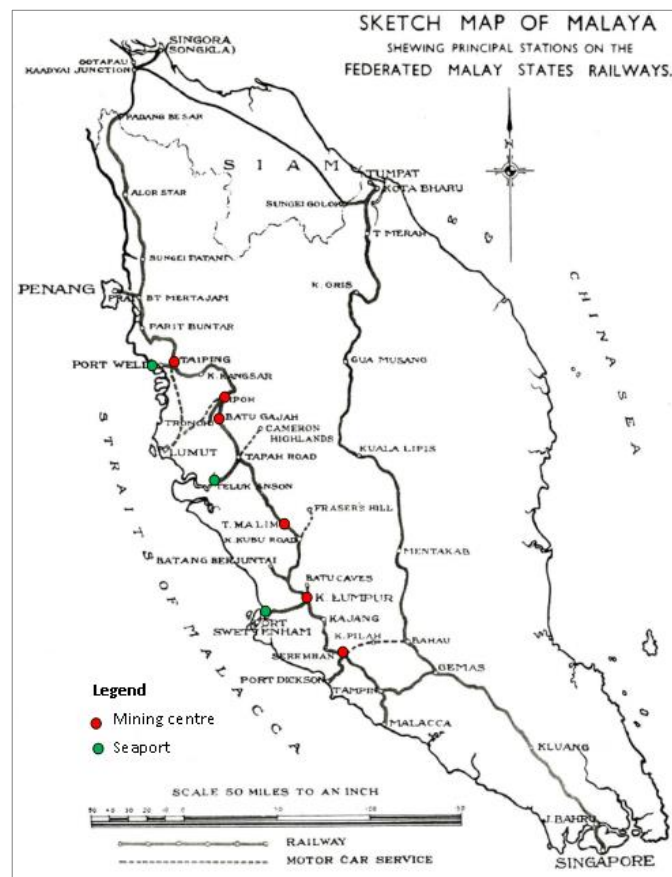


Figure 3.11: Tin mining centres connected to seaports (Taiping-Port Weld; Ipoh and Batu

Gajah-Teluk Anson; Kuala Lumpur-Port Swettenham (or Port Klang) (Palmer, 1935:135).

The first railway lines Taiping-Port Weld built in 1885, the tin ore from seaport will ship to Strait Ports of Penang and Singapore for smelting (Figure 3.12). Kaur (1980) reveals the railway networks is a principal strategy of the colonial economic. This is because the railroad constructions required many iron and a steel materials imported from British's trades. Furthermore, railway networks expansions enhanced the development of postal and telegraph services pertains for the administrative telecommunication. Undeniably, the geographical setting and tin economic blooming evidenced relating to the evolutions of infrastructural development at Western regions in Peninsular Malaysia to be ahead than the eastern Malay States. Leinbach (1975) agreed that tin industry growth supported the expansions of railways, road structures and auxiliary infrastructures.



Figure 3.12: The first railroad was constructed linking the inland mining centre in Taiping to Port Weld.

Besides tin duties revenues, British administrative obtained other profits from road tolls, chartered licences for opium, gambling, and the imported tax commodities (such as rice, tobacco, spirits, opium, salt and fireworks) (Kaur, 1985: xvii). In concurrently, the government expenditures insisted on sustaining transportation networks and public infrastructure equipped by civic buildings, transportation, bridges, government employee wages, and Malay Chiefs' annuities (Kaur, 1985).

3.2.4 Demographic changed and population growth

The transformation of tin economic sector was the key factor of population growth in urban small town. The immigrant of Chinese and Indian workers involved in tin mining and railway construction had created tin mining town expansions in Malay Peninsula. At the

same time, the outnumbered of mining society from diverse background and cultures again formed a multi-cultural society since a century ago. The arrival of large number of Chinese immigrants from Southern China as early as 1840s rapidly increased the number of population of western tin mining town in Malaysia. Hence, major mining towns such as Ipoh, Taiping, Teluk Intan, Kampar, Kuala Kangsar, Batu Gajah, and Kelang in Selangor and Kuala Pilah in Negeri Sembilan populace was constantly enlarge through the impact of mining activities in Malay States (Aiken et al., 1982 in Masron et al., 2012). Ooi (1963) directed the Malaya States was amongst the Nanyang region (Southern ocean) that offered the greatest recruitment opportunity for the settlers in trading and mining nevertheless the British policy yet to encourage cheap and plentiful amount of labours. The imbalance population growth in Malay Peninsula ensued during tin boom era wherein the Federated Malay States (FMS) west coast regions were a concentrated and high density for multi-racial settlers. In comparison British colonial less preference to the Unfederated Malay States of Pahang, Terengganu and Kelantan as the east coastal areas was not privilege on economic returns except Pahang State.

3.3 Mining towns in Malaysia during the tin rush in 19th to 20th centuries

The geology setting of tin lodes in Malaysia had alienated into two zones which are the western tin belt and eastern-tin belt (Ooi, 1963). Whereas, the Malaysia mining towns are situated on Bintang (Larut district) and Kledang range (Kinta Valley) situated on the north-west to south region of Selangor (Kuala Lumpur) and Negeri Sembilan. Tin alluvial deposits in the cassiterite minerals ordinarily shaped much closed to the granite or limestone hill (Palmer and Joll, 2011). Perak state is the foremost catalyst of tin economic during the British colonisation period in Malay Peninsula. Larut is the early tin mine found by Malay chief and later involved by Chinese merchant and British colonial. Gullick (2010) stated that eighty percent of tin in Perak hail from Larut mines in 1876. The tin outputs in 1874 were 10,937 piculs while the working mines had increased from 30 to 120 fields. Long Ja'afar, a Larut Malay Chief exported substantial tin ores to Penang Strait port in the 1850s (King and Halib, 2008).

When Larut tin ores were depleted in the late 1890s, the role of mining centre was gradually replaced by Kinta Valley. Kinta mines distinguished as the most productive mine district at the end of the nineteenth century due to the British mining technology such as the gravel pump and basket dredge in reaching the deeper mining ground level. The extensive mining ground of Kinta Valley that lay on the Main Range of western tin-belt (Ooi, 1963).

From 1888 to 1893, Kinta Valley had contributed mass tin productions almost 100,000 to 231,000 pikuls tin deposits (refer to Figure 3.13). In contrast, the tin outputs in Larut inevitably reduced in 1890s, many Chinese miners had moved to Kinta mining towns such as Gopeng, Kampar and Papan town. Therefore, Kinta Valley noteworthy as the largest and famous western tin belt that produced about 45 per cent of Malaysia's tin (Ooi, 1963). At the second phase of the tin rush era, circa in year 1900s, Kinta Valley was encountered rapid development with twenty-three numbered of small tin towns booms in Kinta mining district.

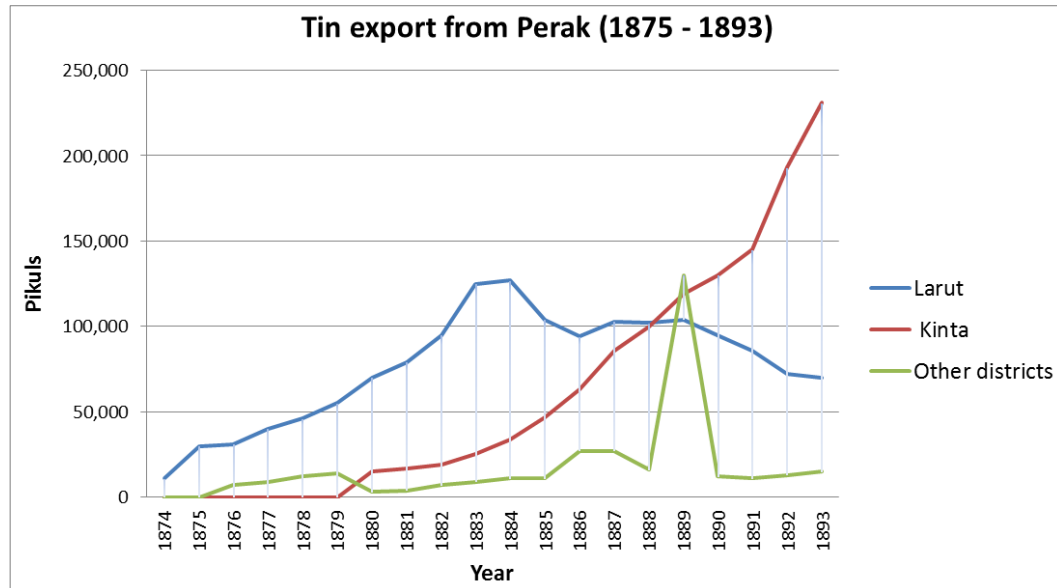


Figure 3.13: Tin export area in Larut, Kinta and other districts in Perak. (Conversion factor: 1 tonne = 6.53466 *pikuls*) (Source: Yip, 1969)

Perak River utilised to transport the heavy tin deposits collected from Kampar and Gopeng tin mining town (Gullick, 2010). Despite, the most direct is export tin ore from Kinta was down to Perak River (Gullick, 2010), the elephant is using to transport the tin ore. The collected tin ore and plantations products were exported through Port Weld and Telok Anson (Teluk Intan) to Penang (Lubis et al., 2010). By 1st January 1896, the initiate straight railroad networks run through Kinta Valley district via Ipoh mining centre to the Teluk Anson (Wong, 1965). The tin mining town centre such like Taiping, Ipoh, Batu Gajah and Kuala Lumpur was selected by British for regards to the strategic location and tending to administration purpose. The mining town centres have connected by the main railway routes and direct towards the seaport. Inconsequently, these mining towns were developed into a commercial centre, transportation hub and also a small town settlement that had provided a livelihood.

In sum, the mining towns' growth in Malaysia encounters with tin boom era wherein the tin town underwent rapid urbanisation and densely populated valley plains. Succinctly, during the colonisation and post-war periods, the tin economic revolves and mining immigrant labours had devoted to the innate of tin settlement. Each tin towns had made up own territory and boundaries surrounding the tin settlement and tin fields and the tin mining town that are connecting to the vicinity waterway (such as riverine and coastal), seaports and railroad networks. Hence, the tin settlement and industry infrastructures had been recognised as the important tin mining town and industrial landscape. As mentioned by Ooi (1963), the temporary buildings at the mining site, lack of water source for tin mining and flood issue caused to the resettlement and rebuilt for the temporary mining camp. In brief, the inheritance tin mining town has to characterise the urban morphology of early town pattern in Malaysia.

3.3.1 Kinta Valley mining district

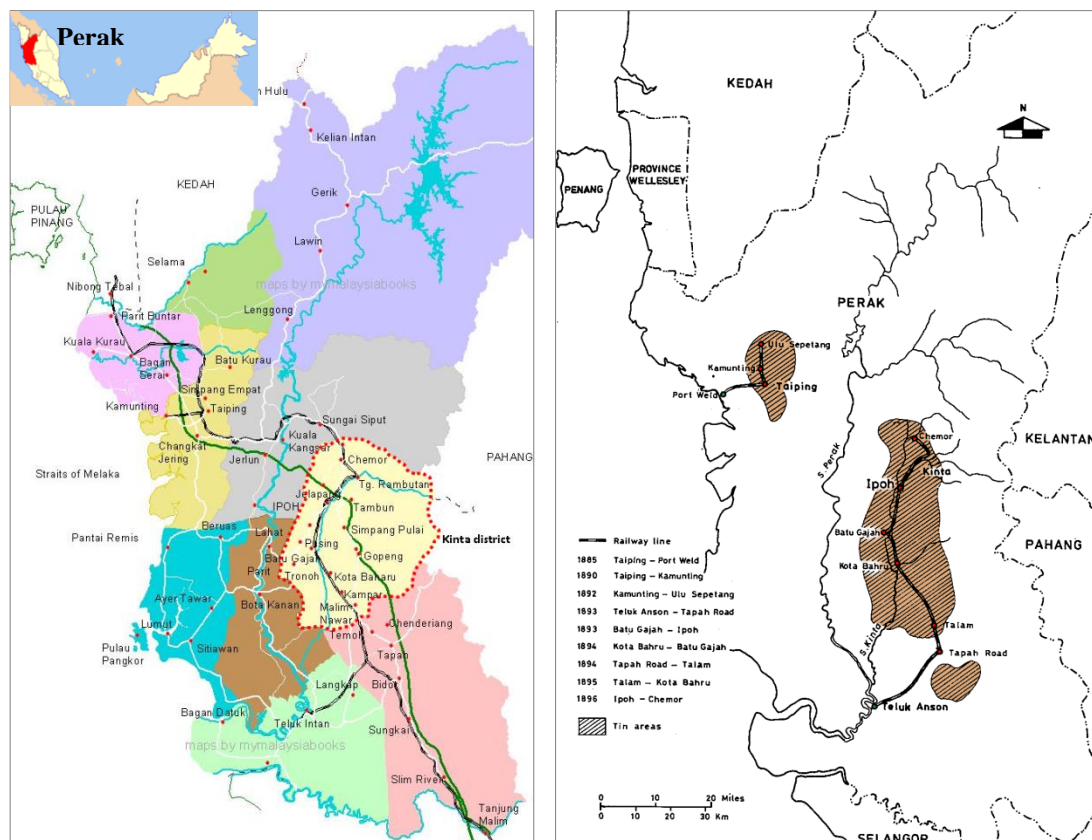


Figure 3.14: Location map of Kinta Valley district (left) and the Kinta mining towns such as Ipoh, Gopeng, Kampar, Papan, Batu Gajah, Pusing and Tronoh (Teronoh) connected by railroads to Teluk Anson seaport (Source: Retrieved from: <http://www.mymalaysiabooks.com> and Kaur, 1985, p. 27).

There are two important mining districts of the Malay States during British colonisation were Larut (Larut Matang area) and Kinta Valley is substantial tin mines producers since early 19th century (Figure 3.15). Both mining towns played a pivotal role to pertain as the essential mining towns in Perak State. Kinta River is connected to Perak River where the profitable tin deposits were found in Kinta alluvial plains. It was approximate one third of Perak's population are settled at the Kinta valley (King and Halib, 2008). The principle tin towns located in Kinta Valley district are Ipoh (757,892 population in 2010); Gopeng (100,000), Kampar (68,000) and Batu Gajah (34,000) (Ibid, 2008). Kinta was distinguished as the most productive mining district in 19th to 20th centuries. Yap (2006) indicated tin ore are easily found at the shallower lowland in Kinta Valley district. Indeed, Kinta has produced 90% of Malayan tin and also contributed as the world richest tin producer. Palmer and Joll (2011:272) stated besides tin minerals lavish in Kinta Valley, the embedded ancillary mineral sources such as "ilmenite, monazite, zircon and zenotime, small scale gold and tungsten (extracted from wolfram and scheelite), granite etc."

There were large expenditures devoted by colonial government in the forest cleaning at Kinta River in years 1880 to 1885 in which to improve the internal communication of adjacent river port with road and cart trail. By 1895s, Tin exportation in Kinta District routed by the railway linkages in between Ipoh to Teluk Intan (formerly Teluk Anson port), the railroad was connected in 1895 (Guan et al., 2009). After the railway track built in Kinta Valley, Taiping railroad transportation was facing declination. As well as, Kinta Valley advocated new tin economic revenues after Taiping and provided a socio-cultural niche for mining traders and tin dwellings. As mentioned by Khoo and Lubis (2005), by the 20th century, most of the small towns situated in Kinta tin districts like Gopeng, Papan, Ipoh, Lahat, Menglembu, and Kampar accomplished with "theatre, bustling with brothels, gambling saloons and opium dens". The Chinese merchant (specifically Towkay) has a strong influence on mining labour recruitment and mining operations of various mining fields in Kinta (Tetsuo, 2009).

Some population in Kinta drastically growth to became the highest Chinese populaces in Perak district (133,436 people) compare to Larut district (only 29, 247 settlers) (Guan et al., 2009). The other small tin mining towns located in Kinta district are Lahat, Papan, Pusing, Tronoh, Kota Bharu, Gopeng, Batu Gajah and Kampar will be discussed in the following section. The mining towns emerged as the distinctive mining town settlement edges with the tin fields. Besides tin mining industry, agriculture (e.g.: paddy, pepper, and coffee and so forth) cultivated in Kinta circa the 1890s, it was the secondary economic

contributor to Kinta Valley. After that, the crop cultivation attracted the Sumatran immigrants congregated in Kinta town. Agricultural sector helped to sustain and retrieval local economic when tin price declined and tin depleted in Kinta District. There was also a problem of squatter settlement and new village allocation during the communist emergency.

3.3.1.1 Ipoh

a) Historical background

Ipoh is named after a poisonous tree known as ‘upas’ (in Malay) and called as Ipoh tree found at Kinta River. The European people called Ipoh as ‘Epu’ while the Chinese pronounced as ‘Paluh’. Ipoh was located on the rich plains of Kinta Valley that brought Ipoh to become an important tin producer and a developed mining town in the early 20th century. Up until 1880’s, Kinta River was the main transportation in connecting Ipoh and other areas either within or outside Perak. After 1874, the tin mining operation in Kinta area was in a slow phase due to insufficient traditional transportation services through boats (sampans), elephants and bullock carts. In 1884, roads were built in Ipoh connected to Gopeng village and the port in Kota Bharu; and linked to the mining area in Papan and Batu Gajah. Nonetheless, the existing road system is inadequate to support mining activities. Therefore, the mining companies urged the British government to build the railroad connecting Ipoh to Telok Anson to improve the tin deposit export (Ipoh City Council, 2014). By 1896s, the distance of 60 miles railway tracks completed which directed from Ipoh connecting to Teluk Anson port in the lower district of Perak.

In 1890, Ipoh had replaced Gopeng and become a tin mining town centre of Kinta Valley district. Ipoh is opened up from a small village into turned into the largest mining town in Perak state by 1911 during tin blooms era. Many mining companies invested by the Europeans and Chinese merchants’ influxes into Ipoh and subsequently many banks (such as the Standard Chartered Bank) and financial firms (Botly & Co.) were established to increase the tin trade investment and loan servicing. Gradually in 1937, Ipoh has replaced Taiping to become a capital of Perak State. The strategic location of Ipoh in between Taiping and Kinta Valley stimulate Ipoh in pertaining as a core mining centre. Ultimately, the mining activities confessed Ipoh designated as a ‘city that tin built’. Ipoh residential area extended to Chemor, Jelapang, Falim, Mengelembu and Tanjung Rambutan (King and Halib, 2008). Ipoh also established town hall council for the city planning and management. Hence, the first town Sanitary Board Ipoh started in 1893 and later called as Kinta Sanitary Board (1897), Kinta Sanitary Board North (1905), Kinta District Board (1916) and finally become the Ipoh City Council (1988) (Ipoh City Council, 2014).

At present, the entire population of Ipoh ex-mining city is 637,903 populations (Department of Statistic Malaysia, 2010). The number of resident living in the core historical zone is 1,865 people (1,239 people stayed in Old Town and 626 people in New Town) (Source: Department of Statistics, 2013). The distribution total land area of Ipoh core zone is 79.70 hectares and buffer zone consist 175.50 hectares. Major land use in core zone used for transportation (27.5 hectares) because of Ipoh old town fabricated on the gridiron streets in the historical core precinct. Others land uses involves the commercial area rated as the second highest (23.63 hectares) and institutions (14.63). Wherein, the total area of 9.4 hectares reserved land for leisure and recreation, and residential has only resided on 0.44 hectares.

b) The urban morphology of Ipoh town

Tin mining activity initiated in '*Kampung Epu*' or Ipoh Village by 1820s (refer to Figure 3.15). In the 1870s, Ipoh was origin from the Malay village and indigenous Village (Orang Asli Sakai) which are located nearby Kinta River. Dato ' Panglima Kinta has developed his possession lands situated at the intersection of Kinta River and Pari River. After Ipoh was open up, the mining town became a strategic place for transit and connected to other border districts subsequently attracted settlers moved into the town. By 1890s, the early town development in Ipoh focused on the Hugh Low Street (current: *Sultan Iskandar Road*) and Brewster Street (renamed as *Sultan Idris Shah Road*) comprises several rows of one storey thatched roof buildings (refer to Figure 3.16). It was estimated 310 houses and approximately 11,000 people inhabitant in Ipoh by 1891.

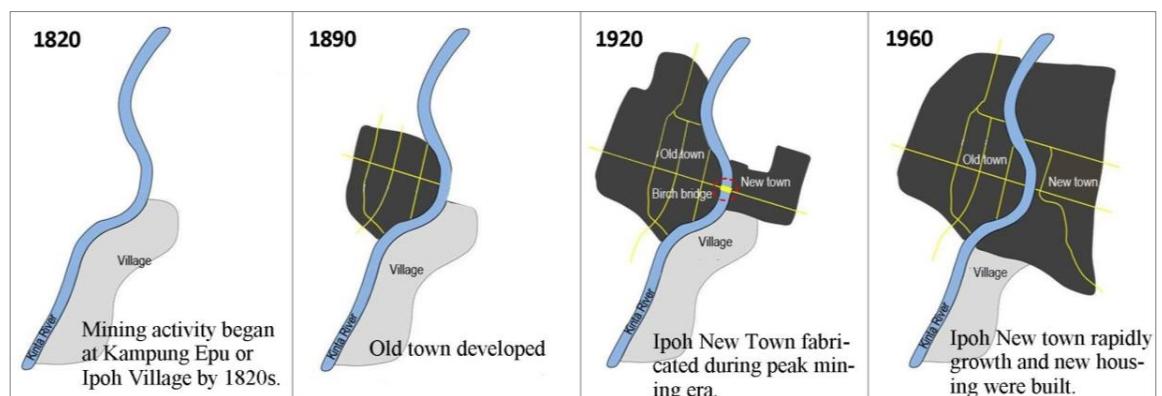


Figure 3.15: Urban morphology of Ipoh town from 1820 to 1960. (Source: Draft Ipoh city Special Area Plan 2013 in Ipoh Municipal Council, 2014)

About 1905 to 1914, due to overpopulation in Ipoh's Old Town, a new mining settlement was built across of the Kinta River. During the peak tin mining era in 1920, Ipoh

New Town was constructed and the Birch Bridge was linked to the Old town area. Ipoh's New Town development was directed by Towkay Yau Tet Sin who constructed 216 buildings (1908) and leading to the launched of a public bus from Hugh Low Street and Laksamana Road to Gopeng in 1910s. The New Township was the foremost Malaya town that designed for the accessible Motorcar. At the New Town quarter, a market and a theatre provided. In addition, Ipoh tin mining town continues to grow with the provision various facilities and amenities such as electricity supply, public facilities (such Club House (Ipoh Club), cinema (Chinese wooden theatre), market (Market Street) and the green public open space (Ipoh Padang or People's Park).

After independence in 1957, the influxes foreign investors accelerated the extensions of Ipoh town to develop the vital early town in the Perak States. The important government buildings such as centre police station (1879), the Court of Appeal (1881) Town Hall (1916), Railway Station Building (1917) built at Club Road area (now called as Jalan Panglima Bukit Gantang Wahab) shown in the map year 1921 (Ho, 2009). Whereas the commercial buildings concentrated at Hale Street, Station Road, Hugh Street, Commander Street, Belfield Street, Leech Street and Treacher Street in the western part of the Kinta River (Old town). More develop the neighbourhood in the east part of Kinta River (New Town) are focused on the streets Hugh Low Street, Laksamana Road, Theatre Street, Yau Tet Shin Street and Cowan Street. Ipoh has grown from the land size of 13 square kilometres (1946-1956) into 387 square kilometres (1997-2010). The new town housing area built at Tambun Road and Gopeng Road. According to Ipoh City Council report (2014), Ipoh turned into a city in late 1980. The 'Greentown' constituted at adjacent to the New Town. Ipoh city is a capital of Perak has thriving as the main administrative and commercial centre.

b) Ipoh tin mining town structure

Ipoh became a centre of the most populous district in Malaya and seventy percent is Chinese population. Ipoh town is divided naturally by Kinta River into two main townships which are the Ipoh Old Town and the Ipoh New Town (Figure 3.16). Ipoh town was the centre of tin collection where the tin ore transportation from the downstream. Briefly, Ipoh was a meeting point of the river, roads and railways and the commerce centre of Kinta Valley. The railways system in Ipoh launched in 1894s linked to Batu Gajah (Aderson, 2012). The entire Ipoh town fabricated by the formal gridiron street layout through the heritage town precincts. Also, the Hugh Loh Street indicated as the central axis of Ipoh city where the road had cut through Kinta River and linked between the Old and New towns.

Ipoh main Chinatown (located at the Leech Street or Bandar Timah Road) and the British administration building and European residency sited at the west part of Od Town.

The most scenic townscape of Ipoh Old Town was the narrow streets layout before the strict building code imposed. In which the local famous Panglima Lane and Market Lane are known as ‘Concubines lanes’. Evidence of historic urban landscape in Ipoh Old town comprises the older and pre-war architectures buildings such as government buildings, Chinese shophouses, residences and historical landmarks. The impressive historical colonial buildings are the Town Hall (1916), railway station and hotel (1917), the Court House (1928) and the Birch Memorial Clock Tower (1909) (Figure 3.17). The colonial heritage buildings built on the higher ground to strengthen the colonial rule. The historical urban public spaces are the Padang and the small people park, Square, Birch memorial-the clock tower (the first British Resident of Perak); market, Club (Birch Club & old Ipoh Club), a hospital, Birch Bridge and school. Besides the heritage townscape, the views of magnificent limestone hills are the important landscape element for Ipoh ex-mining town. The white cliff demarcated where Ipoh tin mining town has built on the Kinta plains.

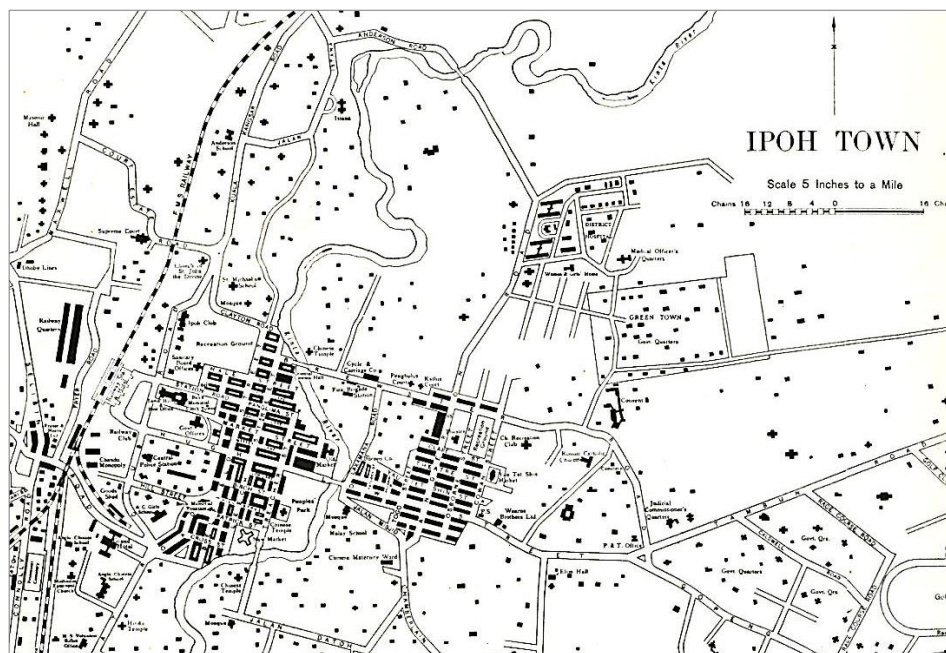


Figure 3.16: Layout of Ipoh tin-mining town in 1921s (Source: Ho, 2009)



Figure 3.17: Overview of Ipoh town (left) and colonial architecture of Ipoh railway station (right). (Source: <http://www.thestar.com.my/news/nation/2015/05/06/ideal-place-to-enjoy-modern-living/> and Author, 2014).

3.3.1.2 Gopeng

a) Historical background

Gopeng was tin mining town located in Kampar district approximately 20 kilometres from Ipoh city. In the year 1880, Gopeng was chosen as the second administration centre of Kinta Valley district and Perak state. The tin town dwellings constituted 268 unit houses that made up of 47 brick houses and 157 wooden houses with thatch roofs (Dolbani et al., 2014a). Gopeng was admitting as the largest mining town in Kinta district settled by 1,000 Hakka miners toiled at the five mines in Gopeng (Gullick, 2010). Nonetheless, the role of Gopeng town being as the main centre superseded by Ipoh and Kampar tin town respectively. The primary tin mining activity in Gopeng operated by Rawa and Mandailing Malays who migrated from Sumatra, Indonesia; and the Semais indigenous (Orang Asli) operates small-scale tin mining. Consequently, the Malays tin mining took over by the Chinese and European miners. Gopeng tin town numerous influenced by Imam Prang and Eu Kong, a notorious Chinese merchant became a leader of Gopeng's mining industry.

The Osborne Mine Company was primarily in-charge of the mining activity in Gopeng. The Strait Trading Company was the first European company started mining operation since the year 1886. Eventually in 1898, Gopeng became the biggest tin producer in Kinta Valley district had contributed virtually 40,000 tons of tin deposits attained from 3,543 acres (1,434 ha.) mining fields. Besides, Osborne was a mining Engineer from Ireland, who had suggested the large steel water pipes construction to obtain water supplies from Kampar River (Sungai Kampar) at the foothill of Cameron Highlands approximately 7km from Gopeng (Dolbani et al., 2014a). The water pipelines supported by the timber structures

and wooden stakes with 600 meters length of a gap between one timber to another (Ibid, 2014a). The huge pipes carried and amassed using elephants and drag till the uphill. In which the tin mining infrastructure of giant water pipelines became the tangible relics and valuable evidence of Gopeng's industrial mining landscape. In current, old shop houses in Gopeng town had adaptive reused as a Gopeng Museum. Wherein, the local museum has attracted many visitors to visit and see the genuine antique collections, the old photograph, and historical exhibition about Gopeng mining town (refer to Figure 3.18).



Figure 3.18: Gopeng museums and heritage house promoted heritage tourism attractions of Gopeng ex-mining town (Author, 2014).

b) Gopeng tin mining town structure

Basically, the early settlements of Gopeng town constituted of the Rawa village and the Gopeng main town. According to Dolbani (2014a), the Rawa settlements found at the adjacent villages at Sungai Itek including Kampung Chulek, Kampung Gunung Mesah Hulu, Kampung Gunung Mesah Hilir, Kampung Pulai, Kampung Lawan Kuda, Kampung Jahang and Kampung Pintu Padang. Most of the shophouses were one-storey buildings and timber finishes located at Eu Kong Road and Tasek Road (High Street) (refer to Figure 3.19). Gopeng is the first town that established a Chinese theatre, and it was the largest Chinese town in Kinta District. It was verified by Dolbani (2014a), Gopeng has destroyed by two fire incidents in 1886s (sixty-eight shops were destroyed comprising a movie theatre) and twelve unit shops situated at High Street. The physical form of Gopeng town is structured in the organic layout fortified with public facilities such as school, police station, and worship buildings. During the colonial era, the early shop houses patterns were influenced by Chinese and European architectures. The mural and decorative on building's façade showed the unique Chinese architectural style, local cultural and custom.

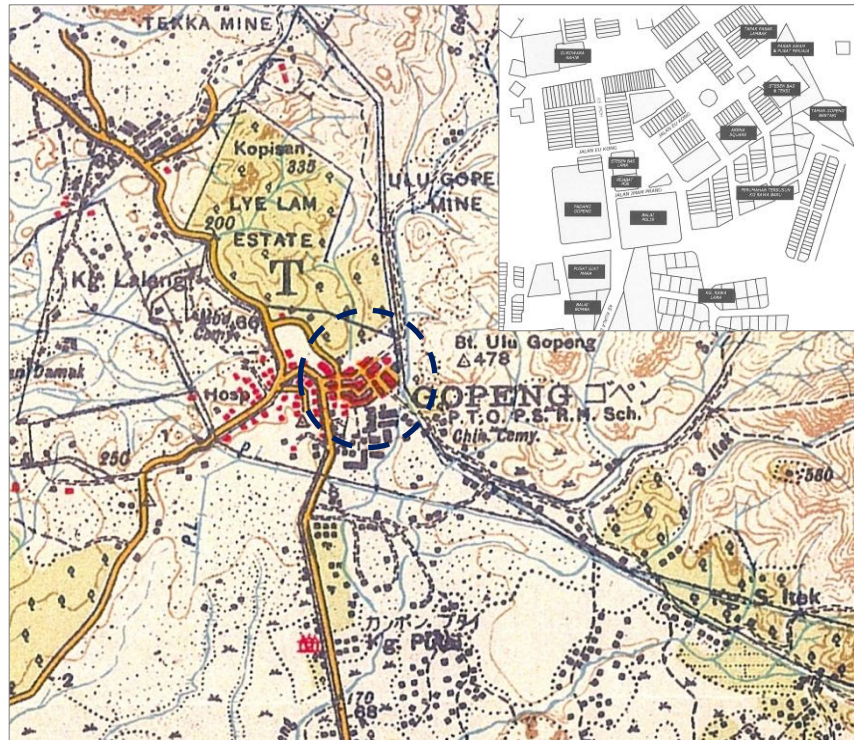


Figure 3.19: Gopeng town (Source: Land Survey Department (16 April, 1941a).

c) Gopeng mining landscape

There was the remnant of broken bridge and giant pipelines. The water pipelines are used for hydraulic mining. And the pipes were imported from United Kingdom and constructed by the Osborne and Chappel Co. Ltd. Lau (2008:8) described the pipelines was manufactured by the Mephan-Ferguson Lock Bar Pipe Co. in UK and transported to Penang by rail to Kota Bharu and the by steam tractor and bullock wagons to Gopeng. The dimension of pipelines was 13.6 km long and 45 inches (1348mm) in diameter.



Figure 3.20: The giant pipelines existed at local village before dismantled in 2010 (Source: Lau, 2008).

These water pipes were construction since 1911 and completed by 1915. There were allocated at a hillside next to Sungai Itik and stretched to dam at Kampar. The connections of giant size pipelines were crossed the jungle and indigenous people's settlement at Ulu Geruh and Ulu Geruntum (Figure 3.20). There was a small hydro-electric generator at the hill of Geroh River constructed by Osborne and Chappel. In the date of 21 January 2010, all the huge pipes and the supporting pillars had dismantled by Gopeng Consolidated Ltd. The last remnant pipeline was preserved as the historical proofs testified the essential mining technology and hydraulic system used in Gopeng and Kampar mines. The heritage relics again had proven the tin industry was the significant backbone to historic economic of Malay States (Figure 3.21).



Figure 3.21: The 100 year olds water pipelines was a significant landmark of Gopeng tin town (left) and the remnant pipeline concrete footings (right) (Author, 2014).

3.3.1.3 Kampar

a) Historical background

The name of Kampar called by Say Yip Chinese clans connotation as 'precious Gold'. In the year 1887s, the lucrative tin deposit found in Kampar located at Kinta Valley. This town located in the foothills of Mount Bujang Melaka irrigated by Keranji River and Kampar River where the rich alluvial plain was positioned. By referring to Chye Kooiin Loong (1886) research, he mentioned a distinguished Malay leader, Iman Prabang Jabor had responsible for opening Malay Villages at the downstream of the Keranji stream nearby Kampar old market. The early village settlement known as Mambang Diawan (means 'Fairies among the Cloud') and later changed to Gunung Mambang Diawan. The first tin deposit in Kampar was discovered by a French mining engineer who initiated to start mining activity in this wealthy tin ground. When the mining activity began, the British administer

JBM Leech selected an area on the right side of Keranji River bank for building shop lots. JBM Leech had decided to change the name of Mambang Diawan as Kampar where the early development closed to Kampar River (cited from Kampar Municipal Council).

In the early years, the small-scale tin mining preceded by the 'dulang washer' or panning along Keranji and Kampar streams (Kampar district council). The hardship of traditional mining technique working by the Chinese labours. The increased of mining merchants are from Taiping and Penang and the Chinese immigrant labours flow to Kampar. Whereas, the European mining enterprise increased Kampar tin outputs by introducing the gravel pump and tin dredge. Both traditional and modern mining activities have increased the great working opportunity for Kampar people till the declining of the global tin market in early 1983. Kampar's tin industry capitalised by the Chinese mining 'kongsis', the French Company SEK and Gopeng miner Eu Tong Sen (Palmer and Joll, 2011). Kampar has growth to become the second largest town after Ipoh, and it was the third most populous town in Perak during the tin industry era (Khoo and Lubis, 2005:145). This mining town population is almost double in 1911s with 11,604 of populations, and it became slowdown in 1921s. Kampar Chinese miners were the majority occupied in Kampar followed by the Europeans, Eurasians, Javanese and Japanese. Nevertheless, this small town facing the problem of crowded squatters squatted on the former mining land, and insanitary conditions.

These days, Kampar has developed as an administrative centre for Gopeng town and also a business hub for local people. The current population figures of Kampar and its surrounding area was estimated 15,074 populaces (Department of Statistic Malaysia, 2010). Moreover, Kampar was in rapid development compare to other cities in Perak. Indeed, Kampar was the fourth largest town in Perak after Ipoh, Taiping dan Teluk Intan. Again, the proven of tin resource plays a significant role in ensuring the development of Kampar to be as rapid as other ex-mining town or cities in Malaysia.

b) Kampar tin mining town structure

Kampar early township was planned on a grid-iron pattern layout. The mining town encompassed two main roads and also functioned as the trunk road namely Jalan Gopeng and Jalan Idirs. During the heydays, numbers of chines shops built to support those Chinese miners. Besides, there were Clan's association, cinema, recreational club house (European, Chinese, and Indian), school, church, opium shop, sundries, cha, chattier tier etc. The SEK (European mining company) built the country first hydro-electric power plant in 1906s on

the Sungei Rawang to supply power to Kamapar and Temoh tin mines (Khoo and Lubis, 2005).

Kampar town is surrounded of ex-mining ponds. Hence, the mine tailing sands, bare landscape and grass grounds. The interesting about the cross streets from north to south remarkable the location of the “hill (Jalan Bukit); mosque (Jalan Masjid), reservoir, dam (Jalan Ampang); temple (Jalan Tokong), market (Jalan Market), Police station (Jalan Balei); Post office (Jalan Post Offic). The street name evoked the sense of permeability. The main historical landmark in the town centre or the China town was Kampar Old Temple and cemetery association and additional Chinese library attached to the temple (Figure 3.22). It’s because the strategic location from a geomantic or fengshui point of view, on an east-west axis, positioned on the higher ground for the valley lookout view.

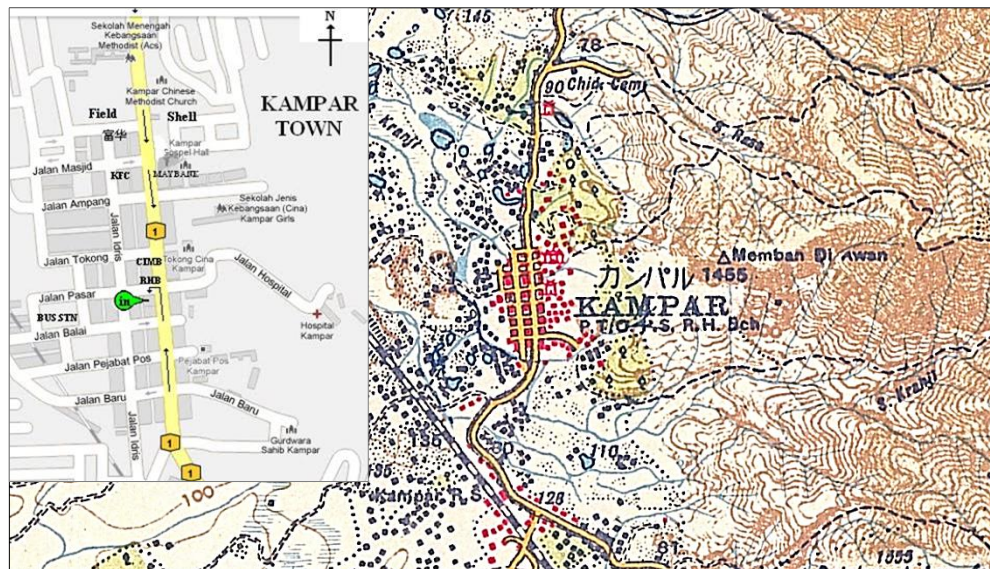


Figure 3.22: The cross-streets of Kampar town were given a name of each civic building that situated at the road intersection. (Source: Land Survey Department in 16 April, 1941a).

c) Kampar mining landscape

Regarding to Lubis et al., (2010), the tin rush to Kampar was in 1891, accorded with the introduction of the short sluice-box (lanchut kecil). Kampar town is strategically situated at the foot of the steep granite outcrop of Bujang Melaka. Kampar town was the first university’s town in Perak. The Tunku Abdul Rahman University’s campus ground was built from the reclaimed ex- mining lands after the world tin price slumped in 1985s. The campus ground is known as Kampar new township, which is located at the north of old town.

Moreover, the housing and industrial development formed a sustainable landscape development to Kampar's town. Kinta tin mining museum is the catalyst of heritage tourism. The museum is courtesy by Tan Sri Dato' Hew See Tong who is the ex-tin miner. All displays related to the rich legacy of mining artefact, tin mining documents, models of mining method, and the virtual life of mining life were exhibited on in the Kinta tin museum.

3.3.1.4 Batu Gajah

a) Historical background

Batu Gajah originally the river-port for the Papan mines, and became the capital of Kinta district on 1884. The name of Batu Gajah means 'Stone Elephant' in Malay language and literally a folklore seemingly two large boulders that resemble elephants found along the Kinta River bank. Batu Gajah is situated 24 Km from Ipoh city, lies on the bank of Kinta River, the downstream of Sungai Raia. Batu Gajah started as one of the many small villages of Sungei Terap sub-district. In 1881s, a small village located in the south of Sungai Terap Village prominently arose after selected to function as a river port for Papan mines and connected with four miles cart road (Khoo and Lubis, 2005). Ho (2007) describes Batu Gajah was an imperative wharf for boat landing on Kinta River; wherein only small boat could reach Ipoh because it was located at Kinta upriver. Batu Gajah tin mining town was developed under Malay chief named Sri Amar Diraja since the 19th century. However, the role of Amar Diraja has deviated when Batu Gajah was chosen as the administrative centre of Kinta District in 1892 during British colonialism period. After that, Batu Gajah endures to develop as a commercial town where 127 lots of shop house were built in 1888 (Lay, Khoo and Lubis, 2011).

Initially, the old part of Batu Gajah (River Street) located near to Kinta River was the concentration vicinity for public. The rows of wooden shophouses were first built in the old town area, some shop owned by the Malays. There is also a police station to uphold the security of the mining town area. In gradually, Batu Gajah settlement resided by many Chinese eventually several shophouses used for gambling and opium den in the old town. River Street (Jalan Sungai) is still important and to remain Perau (Prau) in the old town to become a centre for commodities and the tin deposits collection up until the transportation system was developed. The first railway was built to link with Batu Gajah and Ipoh (8 miles 72 chains) in 1893 and from Batu Gajah to Kota Bharu (5 miles 44 chains) in 1894. By 1895,

the railroad service was accessible in Batu Gajah to Teluk Anson port for the tin ore export services. Batu Gajah underwent many changes after the railway constructed in the mining town. In which, by the end of 1890's, many new commercial buildings built in the new town area that proximate to the railway station leads to Changkat. Chinese and Indian have monopolised local business in Batu Gajah's new Town. Batu Gajah was completely developed by 1917 furthermore the old town and Changkat area (Lay, Khoo and Lubis, 2011).

By the year 1905, Belfield depicted Batu Gajah was a vital mining centre and commercial town of the Kinta district. Certainly, the substantial role of Batu Gajah as a prominent mining town centre supported by such government offices constructed in the 1880s and yet the Kinta district office building completed in 1892 (Figure 3.23). Kinta Sanitary Board headquarters fixed at Batu Gajah. It was a quite balance of different other races community in Batu Gajah although Chinese was still the majority. Also, the fertile tin mines found in Batu Gajah, the vast rubber planting industry helped to raise the local economic and the commercial revenues. Today, the Batu Gajah ex- mining town is populated by 6,738 people (Department of Statistic Malaysia, 2010) where it was a highly popular place for the visitor to experience the heritage trail of colonial relics at the Changkat Road and Kellie's Castle (a heritage bungalow of the wealthy colonial in Batu Gajah).

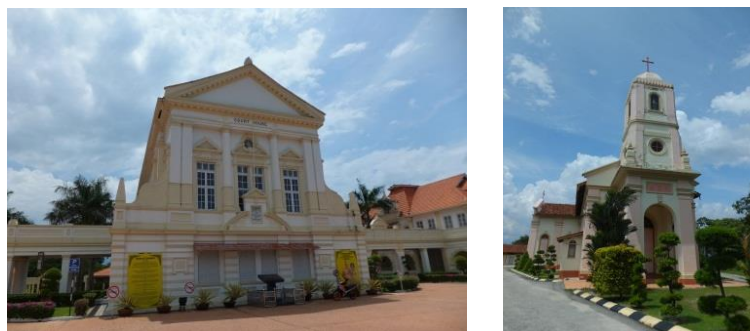


Figure 3.23: The well preserved heritage administrative building and chapel in Batu Gajah (Author, 2014).

b) Batu Gajah tin mining town structure

Hitherto, Batu Gajah ex-mining town centre is remaining as a district headquarters (Khoo and Lubis, 2005). Batu Gajah township layout in the organic form parallels to a long a main street and the old shophouses situated at old town area (Figure 3.24). The colonial heritage building comprises British district office, court house, Batu Gajah Hospital and Land office. Batu Gajah was an administrative centre with gaol, hospital, club, racecourse

(converted to a golf-course), and railway station before it takes over by Ipoh. Ipoh had commercial advantages to replace Batu Gajah as Kinta district headquarter (Ho, 2007). Batu Gajah defined by Ho (2007), a small town possessed only twenty-one first class brick shophouses and not all are the commercial house except the Strait Trading Company. But, Batu Gajah erects a centre of European life where the officers, miners, and planters built lavish residences with beautiful garden (Khoo and Lubis, 2005:117).

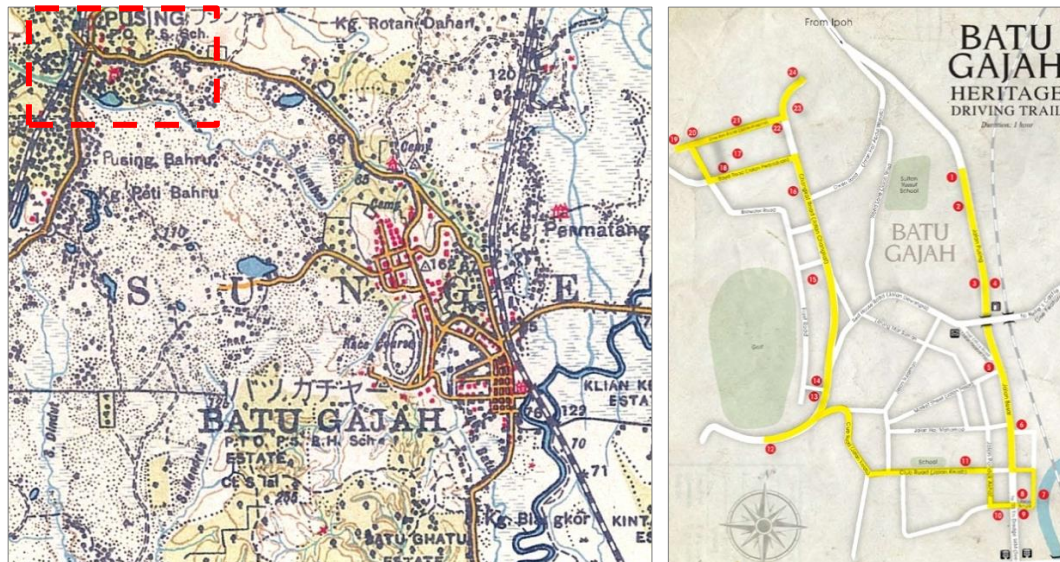


Figure 3.24: Posing (or Pusing town) located about 5km from the north-westward of Batu Gajah town. (Source: Land Survey Department (16 April, 1941a) and <http://www.ipohworld.org/2012/04/21/batu-gajah-heritage-trail-map/>).

b) Batu Gajah Mining landscape

The heritage tin mining infrastructure, Tanjung Tualang dredge no.5 or TT5 was found in Batu Gajah 4,500 tonnes of tin dredge were floating on the ex-mining pond (Figure 3.25). The TT5 is essential to be a part mining heritage whereas this legacy revealed the successful to revival Malayan tin economic. The heritage trail attraction and also the significant landmarks of Batu Gajah are the Kellie's castle, Sri Maha Mariamman Hindu Temple of Kinta Kellas Estate, Batu Gajah Old Courthouse (1892), Batu Gajah Prison, St Joseph Catholic Church, Batu Gajah Hospital, God's little Acre (a cemetery of British Pioneer, policeman, tin miners, military serviceman, planter and civilians to commemorate their lives in fighting the Communist Insurgency 1949-1960s. All these heritage administrative government buildings and old religious house are well preserved.



Figure 3.25: TT5 was designed by F.W. Payne in 1938s in England. The dredge was in operation for 44 years until August 1982 (Kinta Heritage Group, Sdn Bhd)(source: <http://tennysonlee.com>).

3.3.1.5 Papan

a) Historical background

Papan is located 15km distance from the south of Ipoh town and 8km west of Batu Gajah. Papan is one of the earliest mining towns of Kinta Valley (end of the 19th to 20th centuries) which was originated by Mandaling people over 140 year ago (King and Halib, 2008). During Kinta tin rush era and after Larut district dwindled; Papan town initiated as a logging area (Jacques de Morgan, a French traveller who produced mineral map of Kinta in 1884). Therefore, the given name of Papan or 'ka-pan' (pronounce in Chinese) which means quality timber (Chengal wood) cutting by the local Malay since the year of 1700s. The minority was Sikh community in Papan and their settlement closed to the Papan Railway station.

A well-known mines trader, notables as Raja Asal and his successors Raja Bilah possessed the biggest bungalow house in Papan. The early tin mining in Papan was carried-out by Malay-Mandaling and also the vigorously Chinese settlers. Perak Tin Mining and Smelting Co. Ltd was the main European mining company in Papan. This company owned about the 1000 acres of mining lands in Papan. Whilst the Kledang Tin Mining Company Ltd. (1907) and Kledang Prospecting Syndicate (1928) hold the last underground mines in Papan. When the world tin price drop occurred which has had affected local people moving out from Papan in 1921s. The number of population in current Papan is about 1500 people and majority are Chinese community (King and Haib, 2008).

b) Papan tin mining town structure

Papan was the smallest mining town is located at the Gunung Hijau foothill. Tin field was found at the south-west and also northeast of Papan town. The Malay village was clustered as the early settlement in Papan. The Melayu-Mandaling village is located at the north-east of Papan town, adjacent to the Chinese residential at the town centre. Tin booms industry accelerated Papan became one of the mining town Kinta Valley in late 19th century. There are 100 units of old shophouses laid on the main street of Papan. Many facilities have constructed to support local people during tin mining period including Chinese Association, Anglo-Chinese Club, Chinese school, Kwan Yin temple, Chinese theatre, and mosque. Papan was one of the train stop station which is connecting from Ipoh and Tronoh railways lines in 1908. This town had a systematic stable (with cement floor), tiled roof, drainage and good sanitary system erected from British town planning.

However, after the tin price collapse and tin exhausted caused Papan became a laidback town. Papan once a busy mining town and wealthy mining fields was over. In which, local people have moving out, population are declining, less economic activities, and many old shophouses depleted. It was revealed that only 313 people through the Population statistic in 2010. According to Dolbani (2014b), the “Malay residents moved out of Papan in large number and 40% of 146 unit of early shophouses were vanished and not operated. At current, the nearby vacant lands and ex-mining ponds had commercialised and reused for vegetable farm cultivation, freshwater fish pond, and herb and plant nursery managed by Perak Forestry.



Figure 3.26: There are approximately 100 units of old shophouses located perpendicular at the both sided of Papan main street (left) and the layout of Papan town in the 1900s (right).

c) Papan Mining landscape

There are thirteen mining sites operated in Papan area. The abandoned ex-mining ponds utilised for sport recreational by European family for their swimming and boating activities. Johan River was the main river transport that connected to Batu Gajah's river port. Water drainages were fabricated at Johan River supplied as water sources for hydraulic and water pump mining methods. Today, the riverine condition has changed and became shallow. The mixed architectural design of Papans' old shophouses was unique. The typical open courtyard design of the traditional shophouses placed in the middle section of the building. In contrast, the heritage building in Papan revealed the special courtyard layout designed positioned at the rear side of shophouses. While, the Malay Mandaling house or 'Rumah Besar' built by Raja Bilah in 1986s which was function as an administrative centre and an activity place Mandailing people. Papan history gallery was a Sybil Kathigasu's clinic (at 74 Main Road); she was a heroin of Malayan resistance during the Japanese occupation. The existing clinic or old shophouses owned by Sybil has converted into a gallery by interpreting the history of Papan town.



Figure 3.27: The tangible relics of Papan town were the old shophouses and Malay Mandaling house (Source: Author, 2014).

3.3.1.6 Pusing

a) Historical background

Pusing ex-mining town was located at the southward of Papan; left direction from Batu Gajah, and the right towards to Siputeh. Hence, the three intersections road formed a road junction so-called 'Simpang Tiga'. Pusing was located at the sub-district of Sungai Terap, administered at Batu Gajah. Pusing was name after where the water from the lotus pond was utilised for washing tin-deposit and the water was channelled and recycled. The

early tin mining in Pusing was operated by Haji Zainal Aibidin who is a Mandailing decent (Khoo and Lubis, 2005). Sumatran and Perak native Malays were hired to work at Pusing mines. There was Chinese merchant engaged to the underground shaft mines in Pusing. Gradually, the expansions of the road networks which are Papan-Batu Gajah Road at Pusing to Tronoh and Parit in 1892 had thriving Pusing Bharu in extending village settlement. Besides Chinese miners, there are also the Sikh community at Pusing worked as mining labour, security guards, and general labours and bullock cart drivers. In addition, Pusing was named as 'Coconut Grove' because Pusing recreation Club was a gathering place by local police and mining inspectors, European engineers, local miners and socialites occasionally dined (cited in Ho Thean Fook, 2000:203 in Khoo and Lubis, 2005).

Pusing town is flourishing when the Ipoh-Tronoh railway has built in 1908s with a railway station stop at Pusing. The Pusing Lama Tin Mining Company Ltd was the largest mining company established by a European corporation. Since 1904s, the mining company operated 150 acres mines adjacent to old Pusing. Moreover, this mining town admitted as one of the wealthiest tin field and the best-organised mines in the Malay States (Khoo and Lubis, 2005). It had testified the tin outputs of 72,000 kilograms had manufactured in the same year. This mining company was later replaced by Osborne & Chappel and then chartered to Pusing Rubber and Tin Ltd in operating rubber estates after tin production began decreased.

b) Pusing tin mining town structure

Pusing Township is a modest and small mining town; the row old shophouses are the perpendicular line in between the main road (Figure 3.28). Therefore, the historical townscape in Pusing is the old pre-war shophouses (Figure 3.29). The Pusing railway station is importance to connect Ipoh to Tronoh mining town. Nevertheless, Pusing's railway track was dismantled during World War II. This former mining town is tributes to serve the rail transit for Kinta mines which does not reach a vastly development as much as Batu Gajah and Ipoh. By 2010, the country statistic Department reveal the overall population in Pusing is 3,236 people. Chinese clans are the domain population (2,861 people), and most of Chinese are Hakka descent, and they had settled in this tin mining town in the first few decades since the 20th century. The ex-mining town is less developed and remains a laidback condition small sustained with the scale retail business.

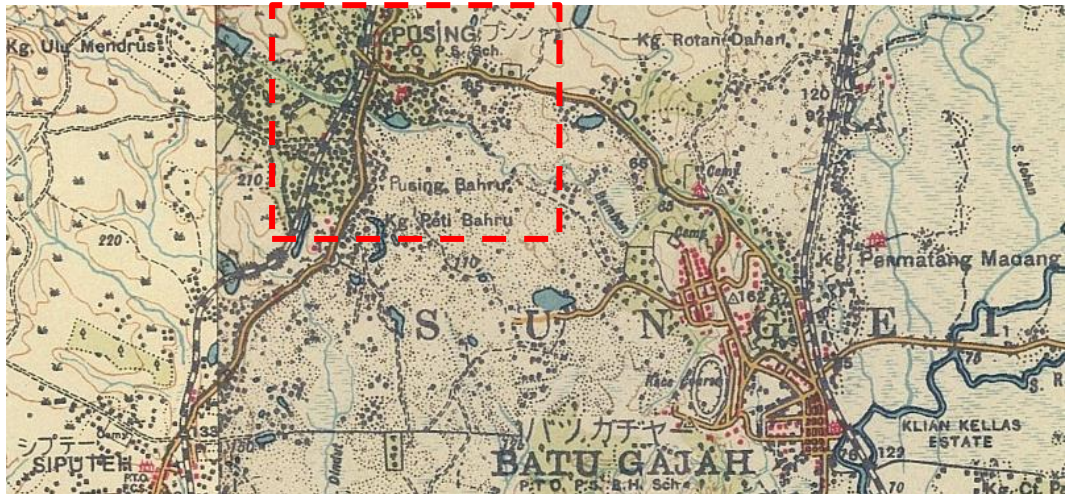


Figure 3.28: Papan mining town located intersection to Batu Gajah and Siputeh town
(Source: Land Survey Department (16 April, 1941a).



Figure 3.29: Pusing railway station (left) and the remnant pre-war old shophouses at the main road of Pusing town (right) (source: Khoo and Lubis, 2005; and Author, 2014).

3.3.1.7 Tronoh (Teronoh)

a) Historical background

Khoo and Lubis (2005) explain Talu people migrated from Minangkabau in Sumatra was first found Tronoh. Tronoh was developed from a village into a small town. Tronoh is the most important mining centre in the first two decade of 20th century. It was a small tin mining town located about 30 kilometres from south of Ipoh. The eminent mining company was the Tronoh Mines Company Ltd owned by Chung Thye Phin, who was a rich businessman and also the last Chinese Kapitan of Perak and Malaya. The Tronoh Mines Ltd become the largest tin producer in the World by 1910 (Khoo and Lubis, 2015). The deep shaft mining method was used during the heyday of mining period. Tronoh became a sleepy town wherein only few rows of commercial streets were operated. There are two

Universities located at the peripheral of Tronoh, the University of Technology Petronas and University Teknologi MARA. Some of the old shophouses frontages had been modified and lack of heritage building maintenance (Figure 3.30).



Figure 3.30: Tronoh's pre-war shophouses.

b) Tronoh tin mining town structure

Tronoh mining township was laid out perpendicular along the main road continuous from Siputeh and Pusing town. While the railway line linking Tronoh town to Ipoh was completed in 1909s. The 14.63 miles railroads connected to other mining town stations at Menglembu, Lahat, Papan, Pusing and Siputeh (Ho, 2007). This railway networks used to deliver tin deposit to Batu Gajah before export to Telok Anson coastal port. Tronoh's town character was similar to Pusing, a secondary railway route connecting to other small mining towns in Kinta Valley. As well as the mining town was sprung up when tin booms lead to the radically increased populace and economic during the tin rush period. The population of Tronoh town is decreased; the 2010 census revealed there is now 461 people occupant in Tronoh.

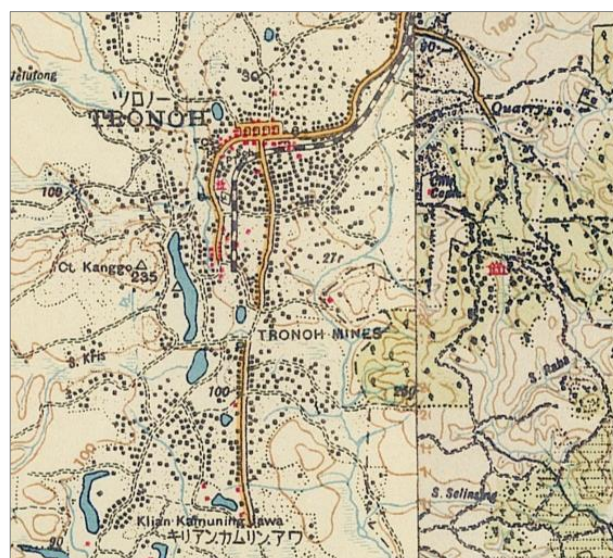


Figure 3.31: Tronoh was the railway terminus of the tin mining town functioned as the branch railway for Ipoh-Tronoh lines.

3.4 Sungai Lembing, Pahang (the east-coast underground mining)

a) Historical background

Sungai Lembing tin mining town located forty-two kilometres north-west from Kuantan district in Pahang state. It was situated on the eastern tin lode of east coastal of Malaysia. Sungai Lembing was notorious as the second largest tin lode mine in the world (Wong, 1965). The underground mine described as the foremost mining producer in the year 1970 (Alshaeb et al., 2009) with the longest, deepest and biggest underground mine (depth: 610-700m and length: 322km). Indeed, Sungai Lembing is one of the richest tin deposits in the world and followed by Bolivia during the 19th century. This underground mining was operated by Pahang Consolidated Company Limited (PCCL) since the British colonial period until Malaysia independent period began from 1906 to 1986. Hence, the historical development of Sungai Lembing town is supervision and synchronised by the PCCL Corporation. Tin ores were collected from the overland of Sungai Lembing and deported through Kuantan River before exported to Singapore. As mentioned by Wong (1965), Kuantan River was the headwater of Kuantan District supported the rich alluvial tin mines.

Sungai Lembing mining ground is located at Sungai Kenau Valley which is the first 'English Village' and a modern town that resembled as 'El-Dorado of the East'. The adjacent Malay villages to Sungai Lembing are Kampung Sungai Arang, Kampung Seberang, Kampung Seberang Kolong Pahat, Kampung Pullock Green (cited from RKK Sungai Lembing). The development of Sungai Lembing town was begun in year 1880s when British takes over the underground tin industry. During the tin industrial era, Sungai Lembing tin settlement was estimated 10,000 populations. However, this tin mining town exposed to few dramatic tragedies such as the caught fires at shophouses area in 1921, flood in 1926, the Japanese invasion from 1941 to 1945 and communist insurgency in the year 1950s. Subsequently, the tin mining industrial was dwindling and ended during the world tin price recession. In the present, Sungai Lembing has gazetted as a tourism destination that is branded as eco-heritage tourism (RKK, Sungai Lembing).

b) Sungai Lembing early township

The development of Sungai Lembing's was controlled by British capital intensive Mine Company. The first mine company was managed by Pahang Corporation (operated in 1888) and subsequently take over by Pahang Consolidated Company Limited (PCCL). The PCCL was established and registered in 1906s. PCCL Company had generated tin revenues during Sungai Lembing tin flourish periods in 1915 and 1926. The PCCL has given the twenty-one years of new concession after Malaysia independent, and the company ended the tin operation during the crucial world tin collapse in 1985. Early development of mining settlement in Sungai Lembing was built near to the riverside and the wharf side. Regards to Carlson (2013), she described Neild who was a mine manager built the early settlement for approximate twenty plus European male employees in Sungai Lembing. Moreover, there are 30 buildings constructed at Sungai Lembing including an office, eight units bungalows for management staff, a boiler house, the stamp shed, and assay house, and tool sheds as well as the Chinese tin labour dormitories (14 units)” (Carlson, 2013:101). In which, the Javanese group had constructed their own accommodation. Timber and atap roofing (palm leaf) were the main material for the houses that built on stilt for air ventilation and reduced pests (Refer to Figure 3.32 and 3.33).



Figure 3.32: The sawmill and Arthur Neild's manager house at Sungai Lembing in 1893
(Source: Carlson, 2013, p121).



Figure 3.33: A scene of Sungai Lembing River and the mine workers dwellings and mine manager house in early 1893s. (Source: Carlson, 2013; p.122)

In early 20th century, PCCL had improved many infrastructures and facilities in Sungai Lembing. During the tin booms era, the expansions of basic facilities such as school, hospital, shophouses, police station, dwellings and transportation system (refer to Figure 3.34 Sungai Lembing urban morphology). There was total 10,000 population growth in Sungai Lembing at the heydays of tin flourish recorded by Kuantan Municipal Council (2008). Sungai Lembing tin mines were shut down in 1986 by PCCL when the world tins price recession and the high cost mining production. However, Sungai Lembing retained the greatest infrastructure in Pahang state after the hundreds years tin operation in this rural hinterland small town. It was known as the El-Eldorado of east where the richest town in Pahang. Besides the historical inheritance mining town in Sungai Lembing, the relic of the shaft tunnel (with total length 322 km, the depth of 610 m and 700 m) which is one of the largest deepest underground mine in the world.

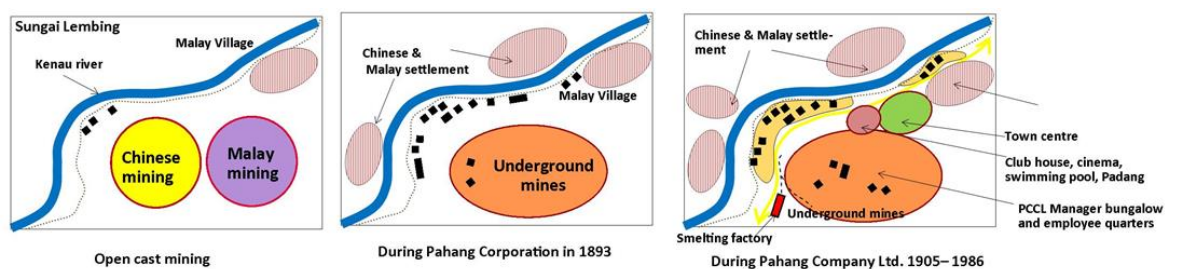


Figure 3.34: Morphology model of Sungai Lembing tin town.

i. The spatial layout of Sungai Lembing

Sungai Lembing tin town had planned and built based on the following zonings encompasses the mining town centre (or a commercial centre), PCCL quarters and offices (social facilities), the mining site's tunnel and the adjacent village settlement (including worker houses or share house) (Figure 3.35).

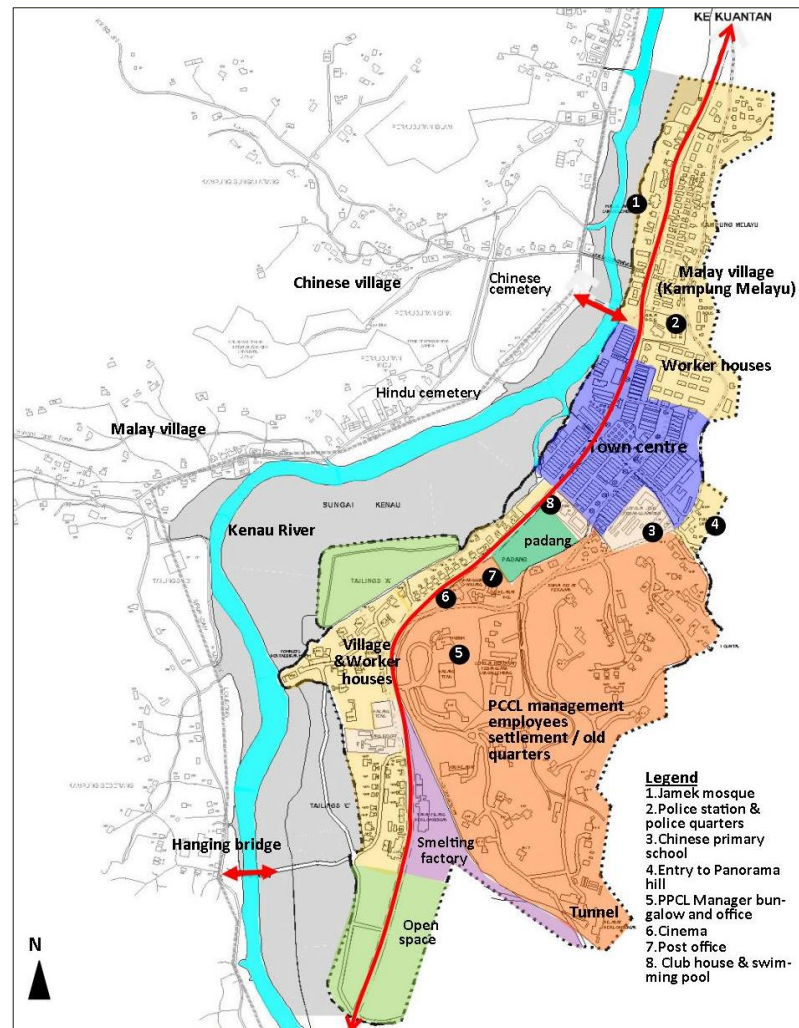


Figure 3.35: Spatial pattern of Sungai Lembing tin town (Author, 2015).

ii. Town centre: commercial zone (old shophouses area located at Canton South Road)

Sungai Lembing ex-mining town located at the scenic valley at Kenau River of Pahang State. This town surrounded by hills and Panorama Hill was the most famous hill that is located in the south-east part of Sungai Lembing town centre. The major land use of Sungai Lembing town centre was also a commercial area for the ex-mining town. The heritage rain trees planted at the town centre to demarcate rows of old shophouses divided by the main road, Canton South Road. The main street designed was connecting the town entry until the end position where the site of ex-tin mining factory located. The historic buildings related to the mining industry are the significant townscape in Sungai Lembing. The two storey old shophouses, association building, market, PCCL Manager Bungalow, PCCL worker dormitories (worker share house), PCCL's management employees' houses mainly constructed from the wooden material or mixture of bricks. The shophouses and residential

houses façade portrayed the Malay traditional architectural style combination with western townscapes (Figure 3.36).



Figure 3.36: The view of Sungai Lembing town with the wooden shophouses and a row of heritage rain trees (left) and the existing club house and now reused as a community centre (middle), old theatre or cinema (right).

Local Malay and Chinese village are located adjacent and opposite side of the Sungai Lembing's town centre by connecting with the hanging bridges. The wooden structure of hanging bridge functions as a built service in the underground mining town and had been one of the tangible heritage artefacts. Furthermore, the British colonial heritage townscape and components in Sungai Lembing are emerged by the European leisure facilities contain the clubhouse, swimming pool, cinema, Padang (cricket field or open square).

iii. The Pahang Consolidated Company Limited (PCCL) quarters and offices

In Sungai Lembing mining town, the colonial miner quarters and PCCL's manager bungalow, PCCL officer's bungalow, PCCL clerk's house, and worker houses were the most dominant townscape. The atmosphere of a tin 'company town' was the presence of these typical houses and mining infrastructure. Especially the PCCL's manager house located at the top hill give the sense of European elite status and the tin town under surveillance (Figure 3.37). PCCL Company recruited the major mining operations in Sungai Lembing. Therefore, worker dormitories and welfare were prepared by the PCCL company. Accordance to Carlson (2013), the English mining company, had provided 'luxurious workmen quarters' opposite to the living labour dormitory in Lahat, Perak under a unsecure building and dirty living environment. Hence, the unique and traditional architectural PCCL quarters are playing the important role to intensify the sensory mining townscape of Sungai Lembing. Also, Sungai Lembing rural landscape's fabrics were surrounded by the scatter hamlets, riverine, panoramic hills, tailings sand, rain trees and natural vegetation. Although Sungai Lembing was once as a 'dead town' after tin mining operation stopped in 1986s

today, the underground mining town was alive again after the heritage tourism revitalization. The industrial heritage values and natural resources were being the vital urban fabrics and mining assets resolutely sustained the lively town of Sungai Lembing.



Figure 3.37: PCCL Manager's residency on top of hillside (left); existing PCCL clerk's houses (middle) and the worker share houses at Sungai Lembing (Source: author and makwardah-momstories.blogspot.)

iv. Underground mines and tin smelting factory

Each tunnel supported by the wooden poles and the tunnel built manually by using a drill powered generated by hydraulic or explosive method (source: Sungai Lembing Museum). "The mining workers or coolies worked in the stamp mill where 850 pounds weights crushed the rock and the separated ore was roasted in the furnaces to drive of contaminating arsenic" (Carlson, 2013) (refer to Figure 3.38). Inside the mining tunnel, the railway lines were built to transport the heavy tin ores.



Figure 3.38 Steam locomotives used to transport tin ores to reach the mining site (left) and the loaded tin ores sent to the stamp mill. (Source: Sg. Lembing Museum and Clarson, 2013)

There were three main mining sites in Sungai Lembing namely Willinks, Myah and Gakak (Figure 3.39). The structure of the shaft is a primary vertical channel where the tin labours and tin ores were carried and removed in and out of the underground mining (source: <http://www1.american.edu/ted/tin.htm>). The miner would reach the mining ground surface

through an elevator or ‘cage’. Also, the ventilation system was built near to the shaft certify fresh air circulation and avoid dangerous accumulated inside the mine tunnels.

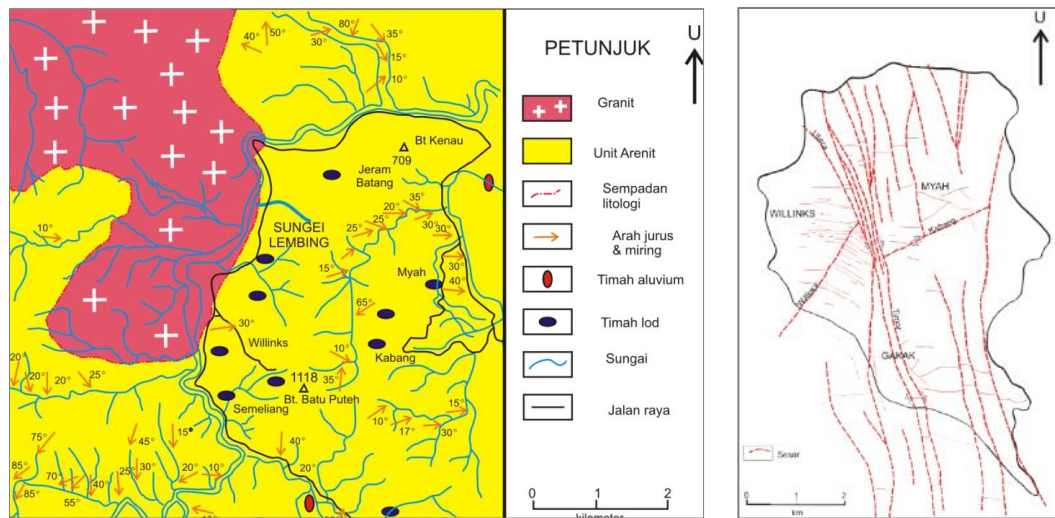


Figure 3.39: Geology map of Sungai Lembing (Arifin et al., 2010)

Sungai Lembing located at the plains valley which is far from Kuantan Port River. Tram and stern-wheel are the main transportation to carriage tin ores from the hinterland Sungai Lembing to Kuantan’s port. The major tin ores from Sungai Lembing exported to Singapore trading port (Figure 3.40).



Figure 3.40: Boats used to carry people, machinery, and supplies to the mine at Sungai Lembing in 1893 (Left) and stern-wheel was used by the Pahang Consolidated Corporation to take supplies up the Kuantan River to Kuala Reman in 1913. (Source: Carlson, 2013)

v. Village settlements

The Malay and Chinese villages characterised the heritage townscape of Sungai Lembing mining town. The traditional houses built on the stilt, jacked roof, wooden and brick material. At the same time, the physical landscape gave a meaning of rural livelihood

and contributed to the formation of the identity of Sungai Lembing mining town. Certainly, the hanging bridge was the essential to connect people from the villages.



Figure 3.41: The tranquillity village settlement at Sungai Lembing.

vi. Mining landscape of Sungai Lembing

Sungai Lembing was a British planned small town. The position of old town indication by the heritage rain trees (scientific name: *samane saman*) which is demarked as the central part of the mining town. The inheritances social infrastructures comprised the old shophouses, club house, cinema, manager's residency, mine worker's house; mine administrators house, *Padang* (open field for cricket and social activity), school, hospital, police station and miner settlement. As well as the have six hanging bridges build to connect the adjacent hamlets and the mining town. The natural landscapes such as rivers, hill, Pelangi and Sungai Pandan water falls are the prominence natural heritage attraction for tourist (Figure 3.42).



Figure 3.42: Aerial view of Sungai Lembing ex-mining town from high ground (left) and one of the entrance tunnel of Sungai Lembing old mine (source: turbineamanlog.blogspot.com.)

3.5 The tin mining town characteristics in Malaysia

i. Geographical position and historical background

The determining of geographical setting where mining deposits found and tin settlement built at the valley of tin belt located. The geography is a principal factor to defined where the mining landscape and tin town natural boundaries laid on and the location of the Main range and East coast range. The floodplain covered by rainforest or swap is where the tin deposit laid. The topographical landscape also influences the types of alluvial mining method supported by tin industrial infrastructure. Moreover, there is mining town such as Papan, and Gopeng was found by the native and Chinese miner and later by the British colonial or the western tin company. The Chinese miner enterprise namely 'Kongsis' or company constituted a substantial role in managing the immigrant tin workers (or coolies) and tin settlement. British colonial empire had governed and control local economic and political imperialism in land lease, tax collection, planning for tin mining infrastructure and Tin Township.

ii. British colonial influences

Tin town or tin settlement is built based upon to the British colonial town planning. In general, a tin mining town in the Malay States developed accordance to the colonial town characteristics which including the gridiron street pattern, open spaces for public uses or garden, commercial area, English townscape, Padang (Esplanade or public square) and square lot. Meantime, tin mining town infrastructure and communication instituted by communal facilities (school, market, religious house and hospital), and transportation networks. British had selected the importance tin administration centre such as Taiping, Gopeng, Batu Gajah and Ipoh. These mining town centres are leading connected with other small mining towns via railway lines or road infrastructures. Indeed, these mining town centres possessed inclusive public facilities to support as a commercial tin nucleus and also British residential area.

iii. Socio-economic factor

In general, the cultural landscape or rural landscape in Malaysia comprises the farmland, tea plantation, rice landscape, mix plantation related to people livelihood. Tin industry activity particularly is the principal revenues in early 19th to 20th centuries (1880-1980). In fact, the tin historic economic evoked the influxes of immigrant workers, western investor, and Chinese traders explored in Malay states

(British Malaya). This reason explains why British Empire did a frontier to Asia region including Malaya for extensive tin in the industrial revolution era.

iv. Multi-ethnic composition

Multi-ethnic groups (Malay, Chinese, Indian and European) from different cultural, religious, and custom backgrounds generated a mixed or plural industry society. Meanwhile, the intangible cultural facet created unique architecture building, townscape and urban spatial pattern which combination of East Asian and Western. The most distinctive build heritage found in tin mining town was the colonial building, Chinese shophouses and townscape.

3.6 Conclusion remarks

The tin industry was the important raw material for the western country that had driven the Malay States economic flourishing in the year of mid-19th and 20th centuries. At that time, there is high demand for the tin plating from the European markets for the food canning. Henceforth, the tin industry export trades have contributed Malaysia in the wealthy for few decades. British colonial had intervention in the Malay States political and economic authorities to control tin trades. Herein, the recovery of the oldest tin industry has made the country's historical planning in leading to urbanisation process. The geography setting of the rich tin lodes influenced the location of mining township in Malaysia. The position of two major tin veins in Peninsula Malaysia where the mining town had constructed at the valley of Main Range on the Western Malay States and Eastern Range situated at the east coast of Pahang. Furthermore, the location of tin lodes specified the surface mining (or the digging mining) and underground mining for each tin town respectively. In short, the characters of Malaysia ex-tin mining towns were identified through i) geographical setting and historical background, ii) British colonial influences, iii) socio-economic factor and iv) multi-ethnic compositions.

Wherein, the justification of typologies tin mining town in Malaysia are based on similarity and divergence of the virtual tin mining town spatial pattern, geography setting, mining townscape and elements. Aforementioned, the influential of British colonialism and the tin mining companies pay the significant roles in covering a layer of tin urban morphology in Malaya settlement. Besides the miner houses, the British residency or mining company quarters built in the tin town. There is British quarter area was segregated from the

tin merchant townhouse, tin labour settlement and native village area. Likewise, the native village undeveloped by British colonial in which the urban development only concentrated in the mining town terrains. These mining towns enclosed by the village settlement, mining field and woodlands. Most tin mining towns began connected to railroad or the extension of road networks during the end of 19th century to replace traditional tin transport methods. For instance, the first railway lines linked in between Taiping and Port Weld. Subsequently, the railroad networks expansions in Kinta Valley mining district over Ipoh was the key tin mining centre and heading to terminus Teluk Anson Port positioned at the lower part of Perak. But in Sungai Lembing, the early tin settlement of the underground mining town was built near to riverside and pier. Therefore, the river became the main communication networks for the tin ores and goods transportation from the hinterland mining town to Kuantan's seaport. However, when the PCCL Company took over Sungai Lembing tin mines, the mining company is responsible for developing a new tin township complemented with the roads, electricity, schools and healthcare (Carlson, 2013). At the meantime, the tin workers in Sungai Lembing gained the better employee accommodation from the PCCL Company compared to the west coast's mining dormitory or Kongsis house.

In opposition, not all the tin mining town in Malaysia had constructed as comprehensive as the British administrative centre cum tin-mining centre such as Taiping (capital of Perak in the 19th century), Ipoh, Batu Gajah and Sungai Lembing. In concurrently, the leisure facilities, entertainment and clubhouse were built in the tin town centre which to create the resemble atmosphere of an English town or quarter. Therefore, only the selected tin mining town centre or British administration centre possessed the inclusiveness amenities. Moreover, the structure of tin town centre divulges the significance contrast to other typical tin towns in the smaller scale. Tronoh, Papan and Pusing tin town have built with the primary road structure, railroad linkages connected to other tin mining towns, old shophouses as a commercial area, and common facilities (marketplace, school and place of worship). It is not surprising that the smaller tin town was less developed and relatively loose urban compactness compares to selected tin town functioned as a British administration centre and commercial centre. Likewise, Batu Gajah shared the town facilities with Pusing town that was located five kilometres from Batu Gajah town.

Each former mining town inherited the succession historical development of tin industrialisation and the heritage properties related to tin mining. The tin industry heritage relics are the industry infrastructure used for tin mining such like the construction of Gopeng's giant water pipelines to the water dam, Batu Gajah tin dredge also known as 'TT5' and the deepest underground mines tunnel in Sungai Lembing. Besides the mining heritage

properties, mining town characteristics influenced by the surrounding natural or rural landscape, the physical pattern and built form of the tin town. For instance, Sungai Lembing mining town was enclosed by the rural landscape of native Malay villages and natural vegetation. Therefore, Sungai Lembing tin town is significant emphasis on the rural landscape setting in comparison to the urban landscape. While Taiping and Kinta Valley tin towns were exposed the distinctive urban townscape consist of the Chinese old shophouses and the colonial heritage buildings. Besides, the hill station cultural landscape was found in Taiping tin town. The hill station is a well-known highland plantation or farming, a place for retreat and vegetable plantation utilised by the British colonist. Regards from above discussion, it to be concluded that the typologies of tin mining town in Malaysia can be categorised as following;

a) Tin town built in between river

Many early mining settlements have constructed near to riverside whereas river settlement formed the early morphology in Malay Peninsula. Therefore, the river is an important landscape element to characterise the ancient Malay town (Harun and Jalil, 2014; Shuhana, 2010). As the authors explained, the river strategic position is for water transportation routes, trading and water source. Although many tin mining town were built much closer to the riverine, the tin settlement does not enlarge the same as Ipoh town. The chronology tin mining history disclosed Ipoh mining town had separated into two parts that are the Old town and New Town during the tin boom era in the early 20th century due to overpopulation in the old part of Ipoh. Therefore, the significance of Ipoh mining town was laid at in between Kinta River (Figure 3.43). Kinta River rooted vitality function to transport tin ore before the railway was build. In fact, the river character has turned into an essential urban structure to Ipoh mining town emerged as the natural landscape and historic townscape component. As mentioned by Shuhana (2011), water bodies influence the townscape where a town located or the sense of place.



Figure 3.43: Ipoh Old town and New town separated by Kinta River.

b) Tin mining town attached to a hill station

The Colonial hill station classified as one of the typology cultural landscape in Malaysia (Ahmad, 2013). In brief, a hill station is another distinctive colonial settlement where virgin lowland forest was open on the top of a hill in Malay Peninsula and also the Southeast Asia regions. As mentioned before, the British colonist resembled the tropical hill station as the western 'cottage house' or the retreat home and escape from the hot tropical temperature condition (Figure 3.44). Entirely mining towns in Malaysia located at the flat alluvial valley at the foothill of Bintang Range, which is the 10-kilometre distance from Taiping town centre. It was considered the shorter distance in between a mining town to the hill station.



Figure 3.44: The cottage built on first hill station built in 1884s on Gunung Hijau Range at Taiping (Source: Lubis and Khoo, 2010).

Taiping mining town manifested a significant attachment to the hill station whereas the British colony developed another residency on the hillside. In other words, there is two European settler quarters existence in the same mining town. Again, the physical extension development of a hill station showed the nobility of Western Class and British rule against the political and social status in the Malay States. Thru the history testimony, Taik Ho & Co., a provision shops run the sedan chair service to carry the Europeans up to Larut Hill. All in all, the cultural and social history of a hill station reflected ancillary European settlement tied to natural and rural landscape in contrast to the mining town embedded urban townscape characters.

c) The British residency built on the higher ground

The urban structure of mining town divided into three zones that are the Colonial or European quarter; Chinese town and the native settlement. The British colonial quarter or mining manager house commonly built on the top of a hillside or higher ground (Figure

3.45). The intention of the British colonial's town planning is to separate the European urban quarter from the locals and to increase the sense of surveillance (King, 1976; Yeoh, 1996 and Home, 1997). Concisely, the different topography of residency in between the British administrator (or mining manager) and the mining settlers and also the natives dwelling evoked the social structure or classes separation in a tin mining settlement. The resident of British colony chiefly mixed of western and Malay architectural designs constructed on the hilltop or higher elevation raised by building footing compared to the native building and Chinese shophouses. Therefore, the colonial quarter built on higher elevation shaped a visible node and discernable in term of the building scale, architectural appearance, and the landscape settings. Figure 3.46 demonstrated British Assistant Resident Residency and Sungai Lembing PCCL's manager house build on higher ground. Indeed, the British colonist attained the scenic visual from the closed adjacent public garden, cricket field, esplanade and the surrounding landscape scenery. In sum, the profile of a mining town is characterising by the British residency built on the higher land-form. As well as, the reason for tin mining town reflected strong urban characters of a western colonial town.

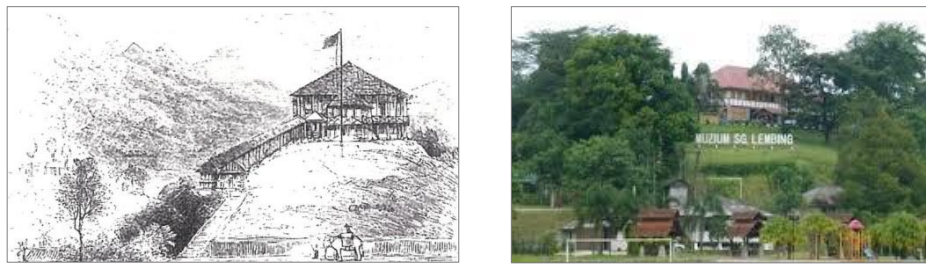


Figure 3.45: British Assistant Resident Residency situated at Bukit Jelutong, Taiping in 1876 (left) and PCCL's manager house on the hillside at Sungai Lembing tin town (right) (Source: Teoh, 2004).

d) The development of tin mining town centre disparity to typical mining town

The physical development of former tin mining town centres such as Taiping, Batu Gajah, Ipoh and Kampar are far more developed comparable to the typical mining town such as Papan, Tronoh and Pusing. Owing to the tin mining town centre was functioned as a British administration headquarter or the state capital as well as the economic centre. Particularly, the nucleus of tin town is upholding as a political, economic, and transportation centre. In opposition, the typical or smaller tin mining town functions as a tin collection centre and the branch railways that were linking to other mining towns for tin transportation. Hence, the tin mining town centre has the larger scale of township development with

convenience commercial, social facilities and transportation communication. This is because the transportation trades and trading activities supplemented to the tin town economics. Adversely, the negative impact on the typical mining town is slowly abating when tin source depleted and turned into a ghost town.



Figure 3.46: There are only two rows of pre-war shophouses found in Pusing town.

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Map source:

- www.mymalaysiabooks.com
- <http://www.ipohworld.org/>

CHAPTER 4

CASE STUDY ON TAIPING TIN MINING TOWN

4.1 Introduction

Taiping case study is selected to justify the unique mining landscape characteristics and attributes in Malaysia context. The criteria of case study selection are based on the determined mining town characteristics and the theoretical conceptions of industrial landscape, industrial heritage and British colonial town planning. In this chapter, the initial discussions are the site selection purpose, Taiping tin town historical background and the development of the tin industry. It is pivotal to discuss the 19th and 20th centuries' tin town planning in Taiping to comprehend the approach of the first tin settlement designed by British colonial during their rule in Malay Peninsula. Also, the chapter deliberation will further look at the important heritage townscape and the associated elements such as town boundary, street pattern, marketplace, esplanade, parkland (landscape character), drainage system, and architectural building and urban spatial. On the other hand, the comparative in Malaysia's mining towns to clarify the significance stigma on the physical and social dimension of each tin town. The third part is to review the heritage significance of Taiping mining landscape and the current heritage conservation and town planning on Taiping. The findings in chapter three will contribute to the next chapter that are the analysis, findings, and discussions.

4.2 Criterion of case study selection

The reason of select Taiping as a case study regarding the historical fact, the strong influential of Western urban planning in a mining town, heritage tin industrialisation have constructed the first railroad infrastructure and relationship of plural society growth in a mining town. The criterion for case study selection is state as the followings;

4.2.1 Historical factor of tin mining industry

Larut was a rich tin deposits district found by a Malay chief (minister) in early 1848 and followed by British intervention in Perak state. The civil wars– Larut War occurred at Larut mines among the Chinese secret societies (Gee Hin and Hai-san clans), Sultan and Malay chief caused to the British intrusions in Perak's politic and economy. Therefore, the Pangkor Treaty agreement signed in 1874 between British and Perak Sultan (Ruler or honoured Monarch). The Pangkor Treaty is a significant history of Malay states where British was legitimated to control Malay rulers and colonial imperialism in Malaya. The tin mining industry is the oldest industry in Malaysia. Taiping or 'Thai-Peng' was the first tin town shaped by Philip C. Coote and namely the 'everlasting peace' to remain the eternal peaceful of the tin town. Furthermore, Taiping is one of the Malaysia's township imposed a Chinese name that had continued till today (1923:54 cited in Taiping's many firsts report, 2013). Taiping is also underwent a rapid transformation of tin rush period and thereafter it was selected as the British administration and mining centre of Perak state. As the capital of Perak state, Taiping became a model of the colonial town and administrative centre (JPBD, 2005 and Lubis et al., 2010). Hence, the circumstantial historical background and the fast growth of Taiping tin town are the significant factors to distinguish Taiping with others mining towns in Malaysia.

4.2.2 The first tin township and the colonial heritage landscape

During the British colonial era, the significant impacts on the urban structure and English urban planning were influenced by the colony in Malay states. Taiping Township is the first British colonial built tin town by enacted of English urban planning. Indeed, the bequeathed postcolonial landscapes portrays the image of Taiping town is seeing as a complete colonial tin town model in Malaysia. Besides the Strait settlements of colonial port cities (in Penang, Melaka and Singapore), Taiping is one of the earliest inland planned industrial tin town during the British colonialism in Southeast Asia regions in the 19th century (circa the 1880s). Notwithstanding, Taiping tin town characters is clearly understood the industry transportation planning (connecting the seaport with hinterland or industrial site), gridiron pattern layout with broad street pattern, rectangular plot, typologies of urban spatial (open spaces), green belt, the land use segregation between the European elites, natives, and immigrants settlements. At the same time, the British colonialism stimulus to political, economic and social erected Taiping inheritance the thirty-three many firsts in Malay states (Malay Peninsula not including Sabah and Sarawak states). These historic resources become the remarkable pieces of evidence to reveal Taiping possess the unique and authenticity

industrial landscape as well as the mining town. The thirty-three first's relics encompasses the township, Perak Museum, New Public Office, Public Garden, rest house, market, barrack, Taiping's gaol, etc. Refer to Taiping's Many First Report, it had reported Taiping has reached the earlier modern colonial town in comparison to Kuala Lumpur is not fully developed in year circa 1882 (Taiping Municipal Council, 2013).

4.2.3 The first railway in Malay States

Tin mining transport is the major tin industrial infrastructure to carry tin ore from the hinterland. The first railway lines constructed in Malay Peninsula had connected between Port Weld seaports (current name Kuala Sepetang) and Taiping mining town. There were three railways stations respectively stopped at Taiping, Simpang and Kota. Manual labour from 1883 constructed the 12.8 Kilometres long railroads and completed in 1885. Jabar, Marzuki and Kamaludin (2014) stated this railroad supported as leading economy roles in Perak over 100 years. Inconsequently, other railways lines were developed linked to other mining towns in Perak, Selangor and Negeri Sembilan. Nonetheless, the Port Weld and Taiping railroads were removed and gone after Larut tin depleted in late 20th century although it was the first railway system introduced by British. In concisely, the railroad tracks exposed the importance of historic economic for tin industry and agricultural sector. Albeit many physical railway landscapes changed, the rail networks have contributed to the local transportation and small towns' expansion.

4.2.4 Multicultural heritage values

There are approximately 20,000 immigrant labours or the 'coolies' arranged to work at Larut mines in the early year of 1860 (Palmer and Joll, 2011). The tremendous Chinese immigrants moved to Malay Peninsula in the early period of Larut tin rush in 1884s. During the economic tin booms in Southeast Asia, the large ethnic Chinese from difference clans migrated to 'nan yang' explicitly as the South Sea. It was an extremely social impact where the Chinese ethics brought their cultural, religion and tradition believes to British Malaya. Also, the Indian labours were hired to work as labour to build the first railway tracks in Taiping. The discovery of multi-ethnics tin industrial society moulded by the native Malay, Chinese, Indian and European. Therefore, the historic townscape of Taiping tin town testimony the ethnicity cultural formed by the unique architectural, landscape, urban structure

and spatial pattern. In short, the distinctive intangible heritages pervade socio-cultural values of a tin mining town.

4.3 Historical background of Taiping

Taiping town (or ‘太平’ in Chinese) is located in the fertile alluvial plains of Larut district in the northern part of Perak State. Long Jaafar, a Malay chief had discovered the first tin deposits sited in Klian Pauh circa 1840 and all the tin deposits were exported to Strait Settlement Penang from Larut (1848s) (Khoo, 2003; Ho et al., 2010; Teoh, 2004). Larut district described by Ooi (1963) was notorious as virtually unoccupied land-dwelling which had grown into a densely populated mining settlement. In 1887s, the sum of eighty tin fields were located in the vicinity of Assam Kumbang (38 mines), Kamunting (30 mining area) and Tupai (12 mining site) as recorded by Doyle (1879) and Tetsuo (2009). The authors also quantified the total of 6,843 miners working at Larut tin site at that time. The great opening of mining sites had successively increased the number of Chinese settlers and residents in Taiping. Teoh (2004) epitomized the influx of Taiping's populations significantly proliferated from 4,000 people (in 1872s-1873s) to 33,000 dwellers (1874s). Chai (1964) stated at the peak Larut civil war in 1872; Larut had produced 1,700 tons of tin priced at 70,000 pound sterling per annum.

As mentioned earlier, Chinese mining labourers worked at the opencast mining ground aided by wooden chain pump and hydraulic pump system. The mining operations in Larut managed by a Chinese clan headman called “towkay or taukeh” was hired those Chinese immigrant miners from the southern part of China. Concurrently, these miners were also a member of secret society who worked indifference mining fields (Ho et al., 2010). However, the miners conflict yet again evoked troublesome on the claiming mines and watercourse that triggered to sequences of the Larut Wars (from the year 1861 to 1873) in between the Hai San clan (Hakka clan) and Ghee Hin group (Cantonese clan). According to Chai (1964), the civil wars intertwined among Chinese groups and Malay chiefs had terrible ruined the realm and utmost the mining fields. However, in the end, this civil war was peacefully ended thru the reconciliation of Pangkor Treaty agreement fall on 20 January 1874. The Pangkor Treaty engagement was remarkable as the beginning of the British intervention in the Malay States. Simultaneously, Perak Sultan (the state’s ruler ship) had to accept a British Residency system and also a colonial advisor in Perak’s political and economic.

Despite the fact the position of Taiping's boundaries had been decided and determined by the commissioners after Pangkor Agreement. Taiping name has derived from a word from Chinese dialect which means an everlasting peace. Therefore, Taiping mining town is located amidst between the other mining settlements of Kamunting (formerly known as Klian Bharu) and Klian Pauh is situated four kilometres from Kota (JPBD, 2010). Hitherto, the eminence tin mining industry in Larut district had exalted Taiping status became a capital of Perak State in 1876s till 1937s. Taiping was a small township constituted of Highland (hills landscape), British residency and government offices placed on the lower ground with main commercial of Chinatown (JPBD, 2010 and Isa et al.,2013) (Figure 4.1). Moreover, the colonial townscapes in Taiping were fabricated by the conception of English town planning. Its urban planning imposed of drainage and sanitation; thoroughfares and English landscapes. Taiping's mining settlement was proudly manifested the first railway lines extended 12.8km connected to Port Weld. The railroad acted as the tin industrial transportation network devoted for tin exportation, mining tools and food stuff importations (Masron et al., 2012). Besides, the roles of social infrastructure and facilities were built to support tin mining operations and to fulfil the local community needs and entertainment.

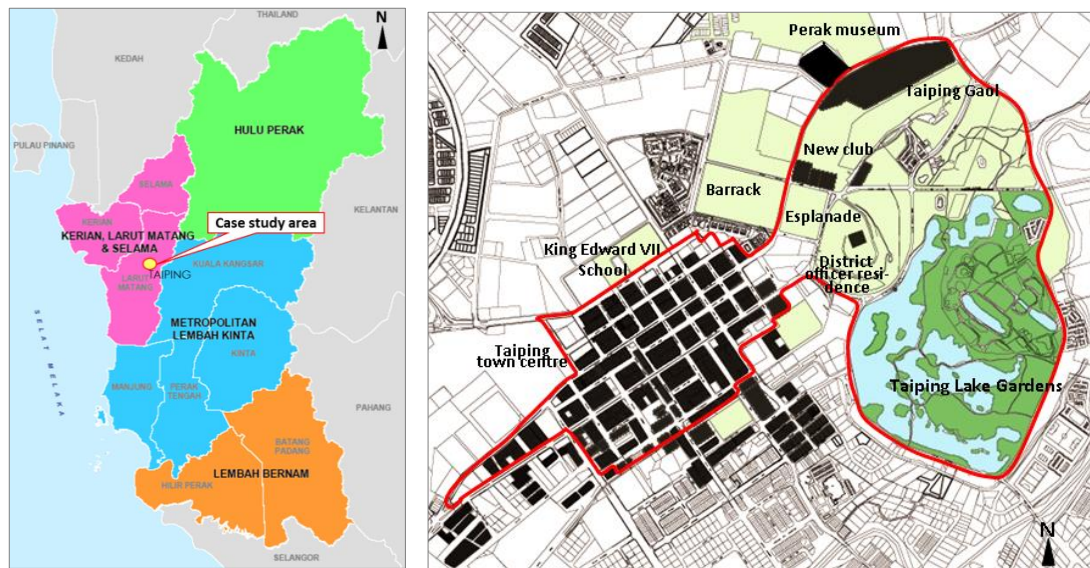


Figure 4.1: Taiping located in Larut district (Kerian, Larut-Matang and Selama district) (Left); Taiping town and the core heritage boundary (right) (Author, 2015).

Until today, the industrial heritage legacies and colonial townscapes are remaining in Taiping settlement (4°51'N 100°44'E). These industrial heritage relics have to depict Taiping turn into a unique tin town with thirty-three of the 'many firsts'. Taiping many firsts possess distinct heritages embraces the public office, recreation, education, transport, association, religious institutions and publication. Taiping has reached 217,647 populations (District and

population statistic, 2011), which is the second largest town in Perak state after Ipoh city. The land use pattern in Taiping heritage town is mainly for commercial, residential, administrative, open spaces for recreational (Figure 4.2). Three categories of key land use in Taiping are the institution (8.93%), commercial and services (14.85%) and residential (0.14%) are shown in Table 4.1. Opens spaces and recreational is the dominant land use in Taiping and the land use proportion covered 20.34 % (or 58.83 hectares). The heritage conservation zone was identified in town centre with the total area of 145.84 ha. In sum, Taiping has unveiled its heritage identity thru the utmost historical significance of mining town and the virtual mining landscape.

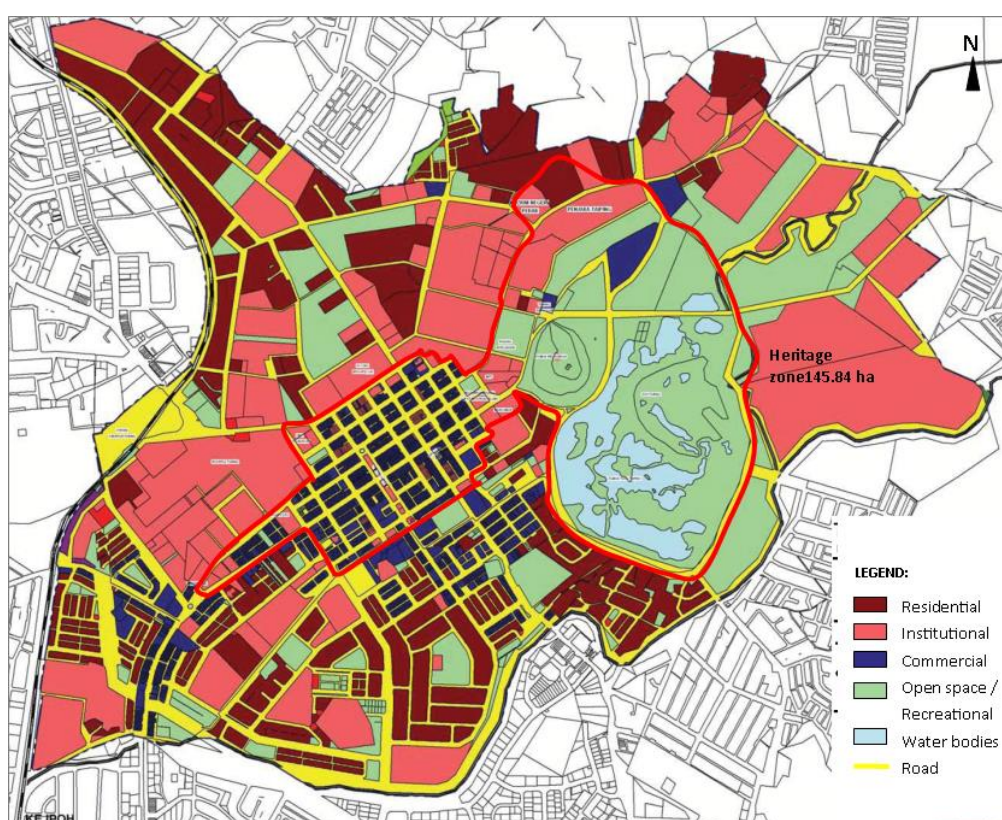


Figure 4.2: Taiping land use pattern (Source: Taiping Municipal Council, 2010)

Table 4.1: Distribution of area nad percentage land use in Taiping town

Land use	Area (Hectares)	Percent (%)	Proposed	Total
1. Institutional	13.02	8.93	0.00	13.02
2. Roads and Transport Facilities	31.84	21.83	0.00	31.84
3. Open space & Recreation	58.83	40.34	0.18	59.01
4. Residential	0.20	0.14	0.07	0.27
5. Business and Services	21.66	14.85	0.52	22.18
6. Water bodies	20.17	13.83	0.00	20.17

7. Forest	0.00	0.00	0.00	0.00
8. Vacant land	0.10	0.07	0.00	0.10
9. Infrastructure and Utility	0.02	0.01	0.00	0.02
Total	145.84	100.00%	0.77	146.61

(Source: Taiping Municipal Council, 2010).

4.3.1 Tin industrial heritage development in Taiping and Larut district

Taiping located at the district of Larut, Matang and Selama. Taiping was selected as the mining centre in 1860s during the British colonial period at Malay Peninsula. There were extensive influxes of Chinese immigrants and merchants into Larut where plentiful tin deposit discovered by 1840s (Palmer and Joll, 2011). At the same time, the Chinese merchants also directed many Chinese immigrant labours from Penang to work at Larut mines covered the area of Assam Kumbang, Kamunting, Topai and Taiping area. All these tin miners or namely ‘coolies’ were come from diverse clans’ recruitment by Chinese merchant which is known as ‘Kapitan’. The status of Kapitan is equivalent to the headman for those Chinese clans or secret societies. Palmer and Joll (2011) stated the initial stage of mining method at Larut mines involved the indentured immigrants’ Chinese labours for the entirely manual mining technique, tin carriage, and tin ore washing using baskets (Figure 4.3).



Figure 4.3: The scene of Chinese open case mining method at Kamunting mining site in 1870.
(Source: Ho et al., 2010)

Larut mining district produced more than one-third (4,000 tonnes) of the tins by 1880s. Doyle (1880) had recorded 80 mines operation in Larut retained by 40 ‘kongsees’ or company that had produced an average of nearly 86 men per mine (Refer to Table 4.2 and Figure 4.4). Larut mines have reached its maximum production in 1884 and soon after the rich tin exhausted (Lee and Lee, 1978:7). Wong (1965) demarcates Taiping mines were in promptly impending tin ceased compared to greater tin production in Kamunting and other mining fields in Larut Valley. Jakson (1963) stated there were nineteen mines approximately

25,000 miners in Taiping and Kamunting mining grounds, and later it has increased to 40,000 mine workers by 1872. The major population in Larut were Chinese miners and other included “tradesmen-blacksmiths, carpenters, vegetable farmer and shopkeeper (Ibid, 1963).

Table 4.2: Distributions of tin mines and mining workers at Larut tin district.

Area	Number of Mines		Number of men	Range
Assam-Kumbang	38	3,827	20 to 210	20 to 210
Kamunting	30	1,809	15 to 300	15 to 300
Topai	12	1,207	60 to 210	60 to 210
Total	80	6,843	15-300	15 to 300

Source: Doyle (1880)

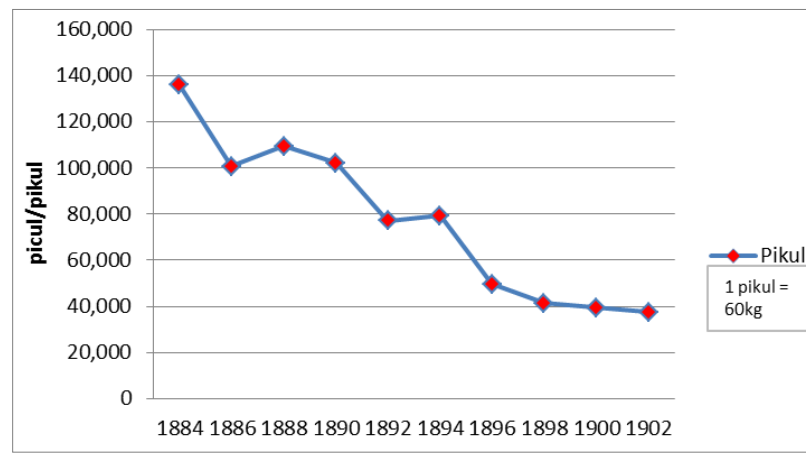


Figure 4.4: Trend of tin ore production from 1884 to 1902 (Source: Malek, 2001).

Khoo (1991) reported tin was exported to Penang from Larut since in 1844 during Ngah Ibrahim chieftain control Larut mine. However, the modern infrastructure development began operated in Taiping when the first railway completed in 1885 by British colonial. Teoh (2004) signifies Taiping railroad was constructed by Ceylon’s Pioneer Crops, a Ceylon expert builder for military roads and railway. The first railway station is located at the place where current school ground for King Edward VII. Later, Taiping railway station had relocation near to the Station Road which had operated from 1890 to early 1900. This rail transport supported and increased the frequent of tin carriage from the from Taiping railway station to Port Weld located at the west coastal swampy area surrounded by the matured Mangrove forest (Figure 4.5). Watye (1959) elucidates Port Weld became a principal port in Malaya overtop Melaka and George Town, Penang (Figure 4.6). Taiping-Port Weld railways were removed in mid-1980 when the rail transportation began declined after tin exhausted in Larut and Taiping (Ho et al., 2010).

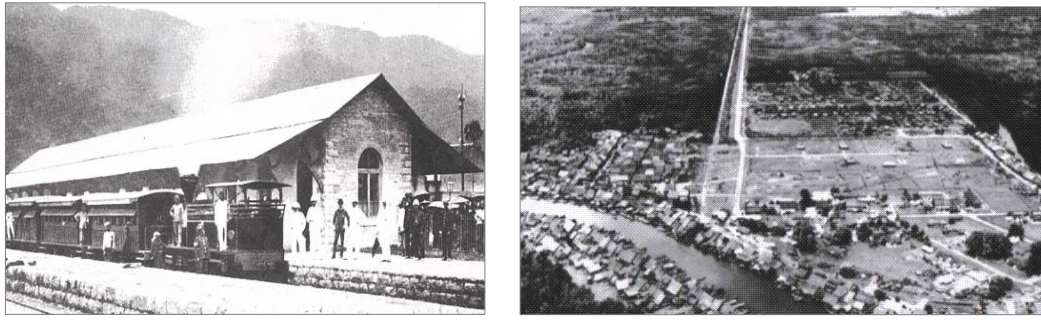


Figure 4.5: Taiping railway station (left) and arial view shows the first railway line connected between Taiping and Port Weld (right) (Source: http://taipingphotogallery.blogspot.sg/p/blog-page_14.html?m=1 and and Ho et al., 2010)

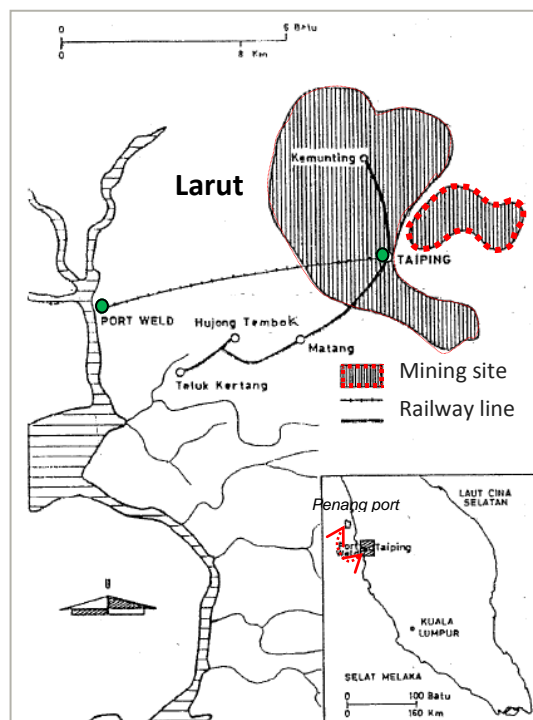


Figure 4.7: Port Weld was an important seaport to export tin ores to Penang for smelting process during 1885. (Malek, 2001)

4.3.2 The chronological history of Taiping tin mining

Table 4.3: The chronological historical of Taiping from 1840 to 1929.

Year	History Timeline	Many first monuments/ heritage buildings in Taiping
1840	<ul style="list-style-type: none"> Long Jaafar discovered tin in the Larut District. The first Tin mine was 	<ul style="list-style-type: none"> Open tin mining activity in the peninsula (1844)

	located at Kelian Pauh	<ul style="list-style-type: none"> Hill resort - Maxwell Hill (1844) Swimming pool – Coronation Swimming Pool (1870) Mosque – Masjid Tengku Menteri (1870) Rest house (1870) Artillery warehouse (1870) Magistrate court (1874) Balai penghulu (1875) Resident's house (1877) Port – Port Weld (1877) English school – Central School Kamunting (1878) Police force (1879) Government offices (1879) Post and telegraph office (1880) Taiping Lake Gardens (1880) Taiping General Hospital, private and government (1880) New Club (1880) Perak Club Railway station and warehouse (1881) Perak Museum (1883) Market building - Taiping Markets (1884) Taiping Gaol or Prison (1885) Railroad from Port Weld to Taiping (1885) Perak Turf Club (1886) Anglican church - All Saints Church (1886) English girl's school – Teacher Methodist Girls' School (1889) Taiping Clock Tower (1890) Esplanade or Padang (1890) Malay newspaper – Seri Perak (June 1893) English newspaper – Perak Pioneer (July 4, 1894) Tamil newspaper – Perak Verthamani (1894) Armed Forces – Malay States Guides (1896) Teaching college – Maktab Perguruan Melayu Ceylon association (1899) Punjabi association – Khalsa Diwan Malaya Association (1903) Indian association (1906) Recreation park – Coronation Park (1920s) Airfield - Tekah Airport (1930) Golf Club (some claimed in
1844	<ul style="list-style-type: none"> Hai San Secret society (Hakkan Chinese members) brought the Chinese workers. The mining settlement began at Taiping Town. 	
1861	<ul style="list-style-type: none"> Civil War First Larut war (disagreement of two watercourse between Gee Hin and Hai San Grups) The first British intervention. 	
1865	<ul style="list-style-type: none"> Second Larut War (gambling quarrel) 1867- both parties were fines due to disruption peace in Penang 	
1872	<ul style="list-style-type: none"> Third Larut War 	
1873	<ul style="list-style-type: none"> Fourth Larut War 	
1874	<ul style="list-style-type: none"> Heavy fighting dragged on until the signing of the Pangkor Treaty Taiping fell under indirect British control and replacing the administration of Ngah Ibrahim. 	
1875/1876	<ul style="list-style-type: none"> Taiping become the capital of Perak's British administration. 	
1877	<ul style="list-style-type: none"> Construction of first railway line between Port weld and Taiping. 	
1879	<ul style="list-style-type: none"> Establish of Government Offices (e.g.: Taiping Gaol/ prison, first residency, Public office and Town Hall). 	
1880	<ul style="list-style-type: none"> Massive town fire which burnt down almost the whole town in Taiping. British introduce the grid iron system, the new urban planning of the town, road were renamed and houses were rebuilt mostly by *Ng Boo Bee. Lake Garden (developed form abandoned tin mines turned into public garden) Maxwell Hills (Bukit Larut) developed as a British Retreat. Widening of streets (70 feet and cross streets 60 feet) Built the biggest hospital for poor set up by Chinese mining community (Yeng Wah Hospital) 	
1881	<ul style="list-style-type: none"> Town Police Station built 	
1883	<ul style="list-style-type: none"> Central school established (later known as King Edward School VII) 	
1884	<ul style="list-style-type: none"> Old Market built (indigenous historic timber structure. 	
1885	<ul style="list-style-type: none"> First railway station completed New market built (2 famous old market in Taiping known as Central Market) 	
1890	<ul style="list-style-type: none"> Exhaustion of tin mines. The mines become depleted and Taiping economy largely dependent on rubber. Esplanade completed- function as 	

	<ul style="list-style-type: none"> military drill exercises and processions. Old clock tower built used as police and fire station 	<ul style="list-style-type: none"> Southeast Asia) Library – Perpustakaan Merdeka Fire brigade
1900	<ul style="list-style-type: none"> The only local tin mining company of 20th century, owned by Ng Boon Bee 	
1929	<ul style="list-style-type: none"> First Aiport (Tekah airport) built- the earliest airports in Malaya and also Southeast Asia. It was served as commercial airport and for the use of the British officers and European merchants and airstrip for the Royal Malayan Air Force. 	

Source: (Ho et al. 2010 and Teoh, 2004)

4.3.3 Early tin town planning of Taiping in between 19th and 20th centuries

Historical towns and the early settlement in Malaysia categorised as Melaka Sultanate settlement, Malay Forts, Malay towns and Colonial town (Harun and Jalil, 2012). British colonisation left the most heritages colonial buildings and urban planning in the Malay States since 1874s. The main purpose of colonial towns formation mentioned by Galantay (1975) is exclusive to exploit the regional trades and economic (cited in Hassan, 2009). George Town in Penang (1786) was the earlier planned port town by British. Later British took over the role of Melaka from Dutch colonial in mid-18th century began occupied in Southeast Asia (Hussin, 2012 and Hassan, 2009). In consequent, the English colonial had incorporated the Port cities of Melaka, Penang, and Singapore became the Strait Settlements in Malay Peninsula controlled by the British East India Company (EIC). The colonial town characteristics in George Town revealed through the physical street layout, institutional buildings, zoning and spatial pattern. Hereof, Penang and George Town owned the principal city of a well-planned English town and eventually the establishment of a committee of Assessor by 1801 (Harun and Jalil, 2012).

Since in the middle of 19th century, hinterland urbanisation began in Malay Peninsula when important tin mining industry growing due to the European industries demands (Sidhu, 1976). British colonial had administered Federated Malay States (FMS) which is also the most tin mining towns formed in the west coast of Malaysia are Perak, Selangor, Negeri Sembilan and Pahang. As mentioned by Sidhu (1979), some of the mining villages turned as an urban service centre and transportation networks to support rural area and expansion of agricultural plantations. The physical development of the colonial tin town built as a tin settlement, social infrastructure development, tin administration centre, and connection of the mining site and

seaport. The primacy urban characteristics of a port city or mining town in Malaysia have constructed on the gridiron planning layout and zoning for administration, settlement, and trade (Hassan, 2009). In accordance to Lubis et al., (2010), British town planning principles disclosed each district have its own capital, fortified with the principles of administration such as district office, town hall, police station, hospital, police station, hospital, Padang (field), a clock tower in some instance, a post office and race course. Despite, Taiping mining town's physical characteristics emerged by the tin industrial transformation of a mining camp changed into a mining centre. With regards to Malaysia's Federal Department of Town and Country Planning, Taiping stood as a momentous historic city was likewise the first garden city in Malaysia and a model of an administrator town in Malay states (JPBD, 2005).

British colonial town planning began in Taiping when the Pangkor Treaty Agreement signed in 1874. Captain T.C.S. Speedy, who was an Assistant Resident (a British administrator) responsible to established Taiping town. He was accountable to drew new Kamunting town located at Klian Bahru whereas he has also named 'Tai-pheng' and to allocate the town vicinity of Kota and Klian Pauh mining village (JPBD, 2005). The first main Kota road constructed to linked Klian Pauh and Klian Bharu (Kamunting) mining sites. Attap houses (thatched roofing house) have built perpendicular to the single main road shown in Figure 4.7. Subsequently, Taiping town was redesign after two massive fires had in 1878 and 1880 burnt down almost the Taiping town. In the rapid growth of tin industrial period in 1879s, the accelerated urban developments of Taiping were accomplished with new gridiron street and government administration buildings. The prominent new buildings such as: "treasury, army barracks, hospital, a powder magazine, a parade ground (esplanade), a government storehouse, gaol, officers bungalow and British Residency were built" (JPBD,2005:23). In 1882, Taiping town was rebuilt (shown in Figure 4.9). Wherein the charm of colonial towns in Taiping clearly seen via the magnificent civic buildings, English streetscape, the marketplace, religious institution, recreational open spaces, colonial hill station, and infrastructures.

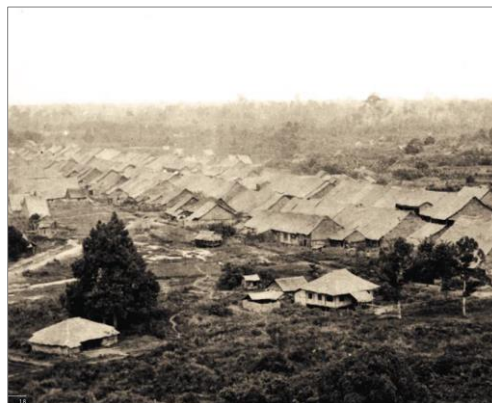


Figure 4.7: Taiping town circa 1879 created by Captain T.C.S.Speedy. (Source: JPBD, 2005).



Figure 4.8: Sir Hugh Low, a British colonial administrator was responsible to rebuilt the modern town Taiping in year 1882.

Moreover, the modern transformation in Taiping mining town was initiated when the first railroads were built to connect Port Weld with inland Taiping. Transportation and services expansions in Taiping to other mining towns had placed Taiping ahead of modernisation during the tin rush era in the 19th century. In a similar condition, besides the British quarter, hill station and administration area reserved for British Resident and European officers, the presence of ‘Chinese town’ an important urban dwelling in Taiping tin town. Especially in Larut district, the majority Chinese merchants and miners settled in Taiping is for the tin trading and mining activities. Isabella Bird, an experienced traveller, had visited Taiping in early 1879. She described the “Chinese town was a long street with visible large bazaar and shops, Chinese style decorations, meeting hall for different clans, gambling house, workshop, the Treasury...” (Taken from Khoo, 2011). Seemingly, the Chinese vernacular Shophouses, townhouse, Chinese temple, and clans association located in the town centre portrayed a dominance Chinese population and eastern culture in a mining settlement. This means that the mix of western town planning and the eastern architectural create a unique townscape to Taiping mining town. In the nutshell, Taiping tin town structuring the intersection of the industrial landscape, colonial planning, and Chinese townscape component formed a heritage mining town. It is essential to show the influence of tin town mechanism enables to assess the evolution changes of mining landscape and the postcolonial landscape features.

The following discourse the important characteristics and components of colonial tin town in Taiping;

4.3.1.1 Taiping's boundary and the physical spatial pattern

The first Taiping Boundaries was set on 23rd February 1874 through the Pangkor Engagement commissioners (Figure 4.9). Isa, et al. (2013) directed the first boundary plan was plot at the Land office Larut on 27 September 1893 (refer to Figure 4.10). Taiping's municipal boundary map encompasses roads organisation which is "the road from west (Swettenham Road) to the east (Kota Road) and from the north, (Waterfall Road) and to the south Kota town." The British military base (for the para-military in the Malay States), treasury and audit office, Rest House (facing Station Road), public offices, barrack, gaol and the British residencies were built in the Taiping Township.

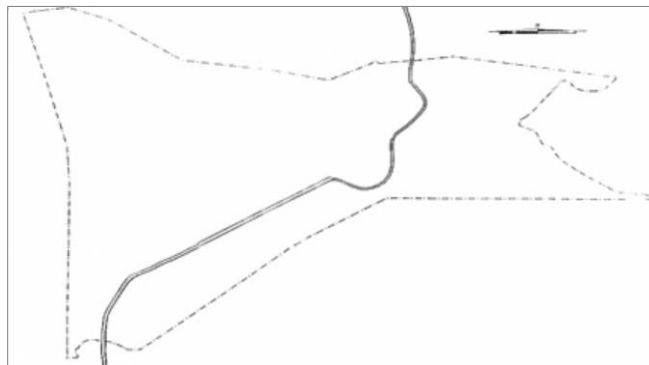


Figure 4.9: The first boundary of Taiping town decided in 1874 (Source: Isa et al., 2003).

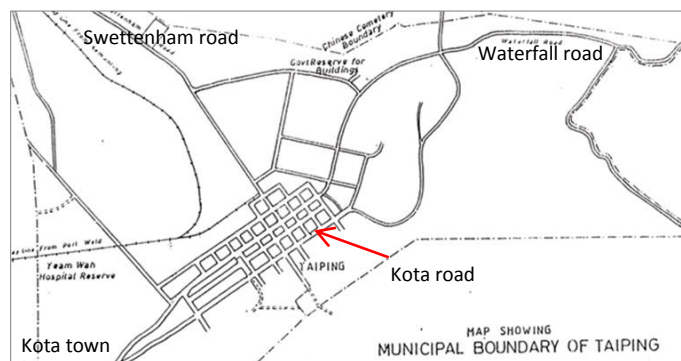


Figure 4.10: Taiping town boundaries in 1893 gazetted by Perak Government (Source: Isa et al., 2003).

4.3.3.2 Port Weld (Kuala Sepetang)

Port Weld was a coastal town operated as a trading port in 1877 for Taiping and Penang tin ores and goods transportation by the cargo vessel. The railroad constructed to

increase the efficiency of tin ores transportation compare to previous conveyed by elephant (Ho et al., 2010). Moreover, Port Weld connected to railway service provided better transport facilities compare to Teluk Kertang port (Taiping Municipal Council, 2013) (Figure 4.11). The old seaport has named as Kuala Sepetang and became a hustle coastal town populated by fishermen (Figure 4.12). Kuala Sepetang was a famous tourist spot for mangrove forest trail, sightseeing, seafood restaurant and charcoal factories.

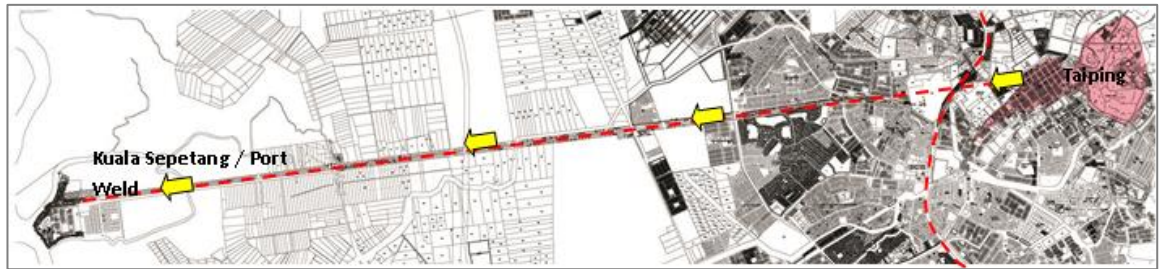


Figure 4.11: Railway tracks connection between Taiping town centres and Kuala Sepetang (Former Port Weld).



Figure 4.12: The inheritance Port Weld signage as a remarkable the history of tin booms era in Taiping (left) and the former Port Weld has turned into a thriving fisherman village (Author, 2014).

4.3.3.3 Road and railway transportation networks

The expansion of transportation routes in Malaya Sates was essential for British colonial to control the spur growth and spread of tin mining industry from year 1870 to 1880 (Kaur, 1985). In 1874, almost thirteen miles cart road built in Larut (Ibid, 1985). The first cart road built in between Matang and Taiping and later extended to Kamunting. In 1879, Taiping's road was connected to Teluk Kertang and the terminus at Teluk Kertang. Inside Taiping town, two trunk roads have built to connect the mining areas which are the Main Road (Taming Sari road) and Kota road. Initially, tin ores carriage on cart road and then transported to railway station situated at Station Road. Concisely, the accessible cart roads are planned directed to each mine located adjacent to Taiping town centre. The routes system are: i)

Simpang mining site connected to Kota road; ii) the Main road connected to Klian Pauh (museum, gaol and coarse turf mining site); iii) Sweetenham road linked to Kemunting (former Klian Bharu); iv) Topai mining site linked to Topai road and passed by Taiping clock tower and then cross on two main roads (the Main road and Kota Road) before reached to train station (Figure 4.13). Ultimately, tin ores transport to Port Weld seaport at the west coastal from Taiping town. Therefore, the gridiron street pattern and the road linkages in Taiping town centre created a solid urban form.

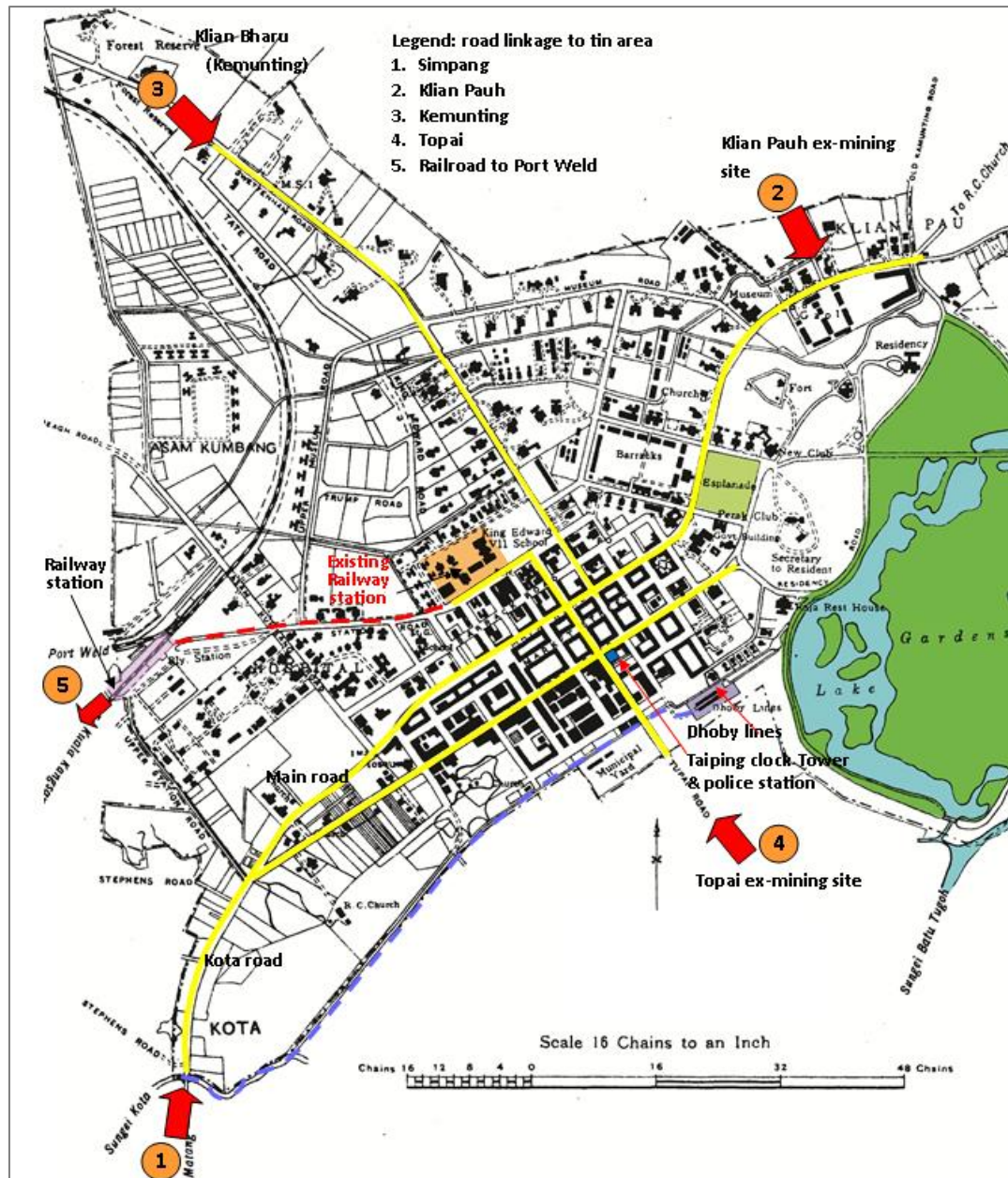


Figure 4.13: The roads and railroad of Taiping town connected to the nearby mining site. (Modified map source: Federated Malay States Railways, 1921).

Furthermore, there was also the oldest railway bridge namely Victoria Bridge had connected Taiping with Ipoh railroads during the tin industry period. It was an important tin industry infrastructure to connect the west coast towns and the Penang's port. The Perak State Railway constructed the Victoria Bridge in December 1897 and officially opened by 21 March 1900s. The 1,158 feet in length Victoria Bridge supported by a thousand feet lattice girder (beam) and six brick piers (Lubis and Khoo, 2010 and), This Bridge was built and raised up to 41 feet from the flood water level where the train had crossed over Perak River. As reported by Lubis and Khoo (2010:122), the Victoria Bridge was supervised by Mr Happlestone designed by British engineers (C.R. Hanson, a chief engineer). Moreover, constructed by the recruited Indian and Chinese and Malay labours and encompasses the 200 contract Tamil labours, 290 Bengali workers, 22 Bengali mechanics imported from Indian (PGG, 1898:410). Therefore the railroad, road and infrastructures are important to provide the communication networks to support mining town development during tin boom period.

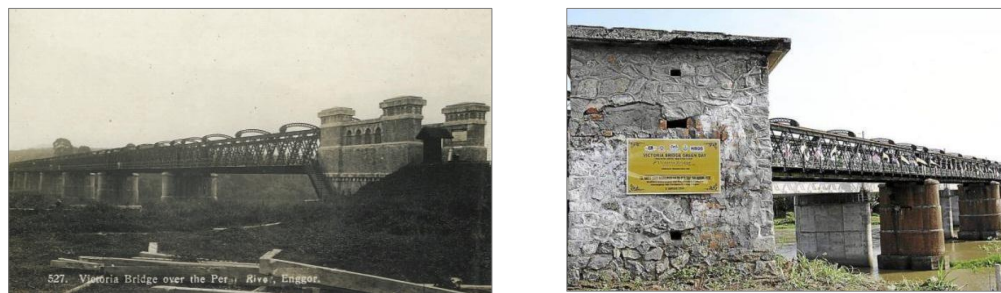


Figure 4.14: View of cast iron Victoria Bridge over the Enggor River (left) and the nostalgic 114 years aged Victoria bridge preserved as a national heritage property (Lubis and Khoo, 2010:123 and <http://www.thestar.com.my/news/community/2014/01/16/green-day-on-victoria-bridge-carnival-is-aimed-at-preserving-and-conserving-the-113yearold-link/>)

4.3.3.4 Wide street, plot square and grid iron street layout

Hassan (2009) states the irregular grid iron system implemented in the colonial town of Port cities and mining towns in Malaysia. The reason of informal grid iron interpretation occurred under the supervision of military officer under British East India Company (EIC) was not the expert in town planning and land survey. British only focus on the economic priority but not the urban development. Therefore, the irregular grid-iron layout can see in George Town port city and other South East Asia Colony (Abel, 1985 and Hassan, 2004 quoted in Hassan, 2009). Prior to 1874, the early road was built by Malay Chieftain (or Mentri) from the discharging port connected to the mines (approximately seven miles long) constructed on “corduroy” principle (Taiping Municipal Council, 2013). The “corduroy” road

structure technique where placed the logs into the mud crossways through road lines. Consequently in 1875, Assistant Resident Captain Speedy extended Taiping inland roads as well as urge to revamps the metalling (or applying gravel) on the Main Road from the Teluk Kertang port to Kamunting mine (13 miles) carried out by the Public Works Department (Taiping Municipal Council, 2013).

The first streets name in Taiping was established by Sir Hugh Low in 1882 and then took over by Sir Frank Swettenham (Isa et al., 2013). In which, the early street name followed the naming of grid design and system. Taiping road or street planned with a system of eleven horizontal crossroads from west to east. While, the two vertical roads laid from north to south namely main road (Taming Sari Road) and Kota Road (Figure 4.15 and Figure 4.16). The additional secondary roads parallel with main vertical streets are Market Road, Barrack Road, and Station Road. The benefits of grid-iron streets in Taiping were the compactness urban fine grains in created a permeable accessibility networks and visual connection from surroundings.

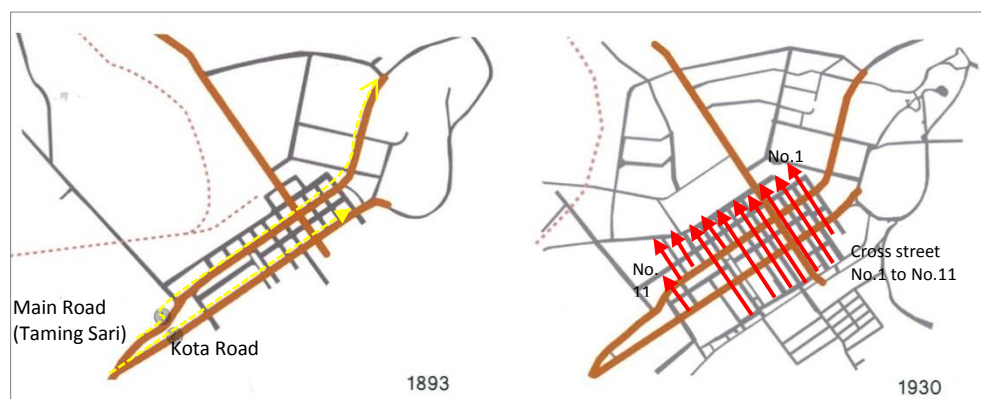


Figure 4.15: The main street width of 70 feet, 60 feet Cross street and 40 feet road depth width was designed and name as cross street No.1 to No.11.(Source: Ho et al., 2010)



Figure 4.16: Ariel view of grid iron layout in Taiping (Left) and the two main roads access to Taiping town centre (right). (Source: Ho et al., 2010 and photo courtesy by Hasmi, 2014)

4.3.3.5 Marketplace

Shuhana (2011) disclosed market is a prevailing activity setting in Malaysia because of the shopping activity nodes concentrated in the urban townscape. In fact, this commercial hub was designated in the Southeast Asia cities was an important nucleus for multi-ethnics (Lopez Conrado in Shuhana, 2011). In Taiping, there are two market buildings respective functioned as a wet and dry market that built in the year 1884s and 1885s (Figure 4.17). It was the oldest timber market building and the best-preserved market in Malaysia. Taiping old market also called as a central market by local people in Taiping. The most attractive part of this marketplace is the timber post and truss structural.



Figure 4.17: 130 year old Taiping Old Market with 200 feet long and 60 feet wide timber building (Source Teoh, 2004 and Author, 2014)

4.3.3.6 Colonial's urban open space

a) Padang or esplanade

Padang is a unique feature of British Colonial Township; an open green space is situated near to the British administration area. It was known as green open space for military drill exercises and processions and also a famous green field for football and cricket games by the British officers (Lee et al., 2012). The clubhouses constructed near to the esplanade which is used by the British nobility and also officers to rest after taking part in sport event. Padang or esplanade is utilised as a public square, showing the status of officialdom, cricket field and for civic gathering (Taiping Municipal Council, 2013). The green field was a “spatial tradition and structured open green space for surveillance, military drill display and governance” (Lai, 2010:55). Today, Padang is uses for the sports tournament, parade ground, and also formal event celebration such as National Day (Figure 4.18).



Figure 4.18: View of Esplanade and the background of government offices (left); Padang esplanade was utilised by local people for sport activity (right) (Source: <http://chungsite-roots.blogspot.jp/2011/01/reasons-to-emigrate.htm> and Author, 2014)

a) The circus ground

Tupai recreation ground or circus ground built in the 1920s. It was a public open space for recreational and entertainment purposes. The existing circus ground latter replaced by a hawker centre.

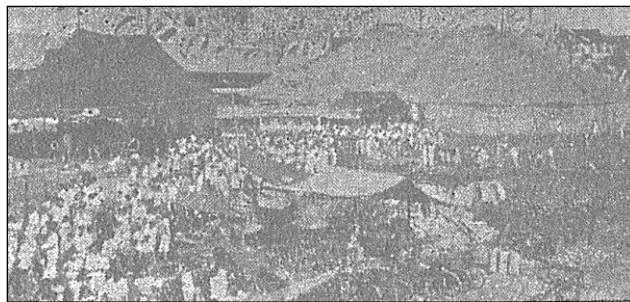


Figure 4.19: Tupai recreation ground or circus ground (source: Taiping Municipal Council, 2013).

4.3.3.7 Public Garden and heritage rain trees

The sixty-two hectares of Taiping Lake Garden was built in 1880s from a piece of abandoned mining land. This former mining site was donated by tycoon miner Chung Thye Pin. The initiative of Mrs. Swettenham assisted by Colonel Robert Sandilands Frowds Walker (a Perak Police Chief) and his police team have contributed to construct this public garden (JPBD, 2010 and Isa, et al., 2013). Walker's conception of transforming the garden is valued for Taiping community. The garden lakes were converted from the mining pond into lakes. There are ten man-made ponds and three central lakes designated as the South Lakes, West Lake, and Jungle Lake (JPBD, 2005 and teochiewkia.blogspot, 2009) (Refer to Figure 4.20 and 4.21). Taiping Lake Gardens is asserted as the first Public Park in Malaya after the first Penang botanic gardens had built in 1794s.

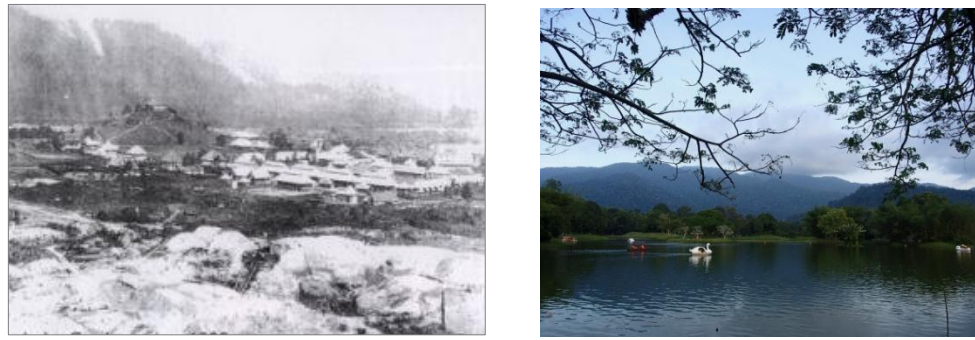


Figure 4.20: The view of the Taping Lake Gardens in 1880s (left) and the pleasant water bodies for boating activity on the lake (right) (Source : <http://chungsite-roots.blogspot.jp/2011/01/reasons-to-emigrate.html> and Author, 2014) .

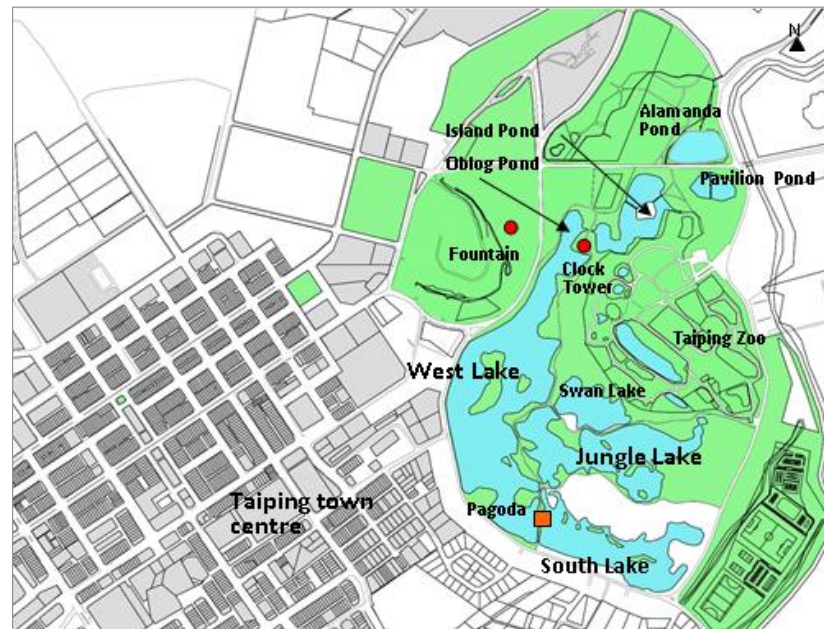


Figure 4.21: Taiping Lake Gardens and the ponds layouts (Author, 2015).

The primary function of Taiping Lake Gardens is to sustain the town (Ho et al., 2010). Besides, the Lake garden was utilised as a water retention pond to prevent flash flood in Taiping. This public garden was designed imitated of the royal parks in British with attractive softscape and parkland designed compositions such as winding paths, water bodies, large areas of green lawn and undulating landform. The former golf course was located near to Taiping Lake Garden and British Residency (Teoh, 2004). Although the Lake Gardens is created for British officers during the heydays but at the present, the biggest recreational park served as the essential green space for physical recreation, leisure, sightseeing, boating, relaxation and family gathering area. The more than hundred year olds rain trees were planted surrounded the Lake Gardens.

The heritage rain trees (scientific name: *Samanea saman*) have planted at the circular roadside trees of Jalan Taman Tasik. Eventually, one of the road located proximity to Lake Gardens was name after the rain tree, the *Samanea Saman* Road (or *Jalan Samanea Saman*). The heavy rains in Taiping allow the heritage rain trees to live for centuries. Besides, rain tree, the *Angsana* tree or explicitly as *Pterocarpus Indus* had chosen as the street planting planted at the cross streets of Taiping. Both tree species are structural spreads, enormous and tall; and give the shades. Therefore, the functional of landscaping in Taiping is essential for heat reduced as the tropical temperature consider hot for the Europeans. As well as the greenery landscape and vegetation improved the quality environment of bare mining sites which are enclosed to Taiping. At present, the heritage rain trees at Taiping Lake Gardens were protected by Local Municipal council. In contrast, some old trees at Taiping's street are reducing and had been removed due to the tree size and foliage obstructed car parking lot and block the view of building façade (Figure 4.22).



Figure 4.22: The iconic heritage rain trees are the foremost attraction at Taiping Lake Garden (Left) and the remaining old tree at Chung Thai Phin cross street (Right) (Author, 2014) .

4.3.3.8 Larut hill station

Literally, the tropical hill stations in Malaysia utilised as a colony dwelling where a place for healthcare and recreational for government servant, military staff, planter, miners and other European settler or else the strategic bases and military cantonment during the early 19th century (Yusoff et al., 2009). The Larut Hill station was the first built in Malaysia completed in the 1890s. Larut Hill nourished as Maxwell Hill, and it found over a decade ago in circa 1884 (WWF Malaysia, 2001). It was the oldest hill station in Malaysia which built on the top of Gunung Hijau on the Bintang range where the Taiping town was at the same foothills. Larut Hill is 43.28 metres above sea-level and 804.672-meter distance from Taiping town. Bukit Larut is an important water catchment for Larut, Matang and Selama

Districts. The water catchment area is partly of Kuala Sepetang River basins consists of Batu Tegoh River, Jana River, Larut River and Tupai River (WWF Malaysia, 2001).

‘The cottage’ was the first bungalow constructed on the 4,513 feet on Caulfield’s Hill (Lubis and Khoo, 2010). In consequences, close to 1907s, there were five government bungalows namely the Maxwell Hill and The Tea Garden (1887s). The Hut (1889) and The Box (1897), The Federal Bungalow (1907) is a private bungalow of Perak Superintendent of Government Plantations and yet that private bungalow notorious as ‘The Nest’ (circa 1890) (Ibid.,2010). Larut hill station also a used as farmstead for vegetable plantation and cattle. It had documented by Wright and Cartwright (1908:251) “the dairy cattle were produced sizeable quantities of milk and butter, while the government plantations produced 26 kinds of English Vegetables (such as: French beans, carrots, beet-root, lettuce, cabbage and so on).

4.3.3.8 Drainage system in Taiping

As indicated by the Federal Department of Town and Country Planning (JPBD, 2005), the establishment of Taiping Sanitary Board was to handle the issue of fresh water and sanitation. The Federal Department also emphasised Taiping Township has re-planned and reconstructed with the new gridiron street pattern and double storey brick shophouses by accomplishing proper sewerage and sanitation systems after Taiping town had caught fire in the 1880s. Whereas, the greenery landscapes in Taiping planted with rain trees at both sided of streets inside the town and also Taiping Lake Gardens. Taiping is the wettest town in Malaysia with heavy downpours with average 4,000 mm annually (JPBD, 2005). The outline of sewerage system in Taiping can trace by the existing drainage system where the overflows water level outflow from Lakeside downwards to the grass swale or waterways along Taiping downtown (Ho et al., 2010). In consequences, the freshwater water runoffs discharge of the sewerage water and waste treatment plant and last to the west coast of Larut estuary (illustrated in Figure 4.23). Taiping drainage system diverts the natural rainwater and freshwater catchment constant flows through the former mining ponds and canal to prevent flood during the heavy downpours.



Figure 4.23: Drainage system in Taiping town centre. (Source: Ho et al., 2010)

4.3.3.9 The Dhoby line or laundry services

The understanding of Dhobi in English means washer man or washerwoman (cited from Oxford Dictionary, 2015). Dhoby line or laundry service is situated at Tupai Road were provided by the Town Board in 1901 (Taiping Municipal Council, 2013). The Dhoby line is located at southeast of Taiping town proximity to Taiping Lake Gardens (Ho et al., 2010). In an early colonial period, Indian dhobi is recruited by British for the military troop's cloth washing. In fact, some Chinese families have also worked as the washer men that had no specific for only Indian ethnic livelihood (Ibid, 2010). Through the interview with local people, during the heydays, there are twenty concrete pools have used for the traditional laundry activities. The main water sources of each washing pool accumulated from the side canals where the watercourse directed from Taiping Lakes Gardens. By today, the same dhoby line is remaining as a laundry service inherited by the family in Taiping town (Figure 4.24). The unique of this traditional clothes washing is the wet clothes held through the twists of clotheslines (Figure 4.25).



Figure 4.24: The wooden old Dhoby house (left) had replaced by a new concrete block for laundry services (right). (Source: Author, 2014)



Figure 4.25: The linkages of canal and drainage system connected to Dhoby lines in Taiping (left) and the washing lines at the open space in front of laundry shop (Source: Ho et al., 2010:77 and Author, 2014).

4.3.3.10 Architectural building and urban spatial

The understanding and function of many types public building in colonial town which conveyed political power to represent the British Empire, symbolisms, and the character of Western urban civilisation (Home, 1997). The typologies of Colonial building, Chinese shophouses, worship, Clock Tower, Taiping Gaol and civic buildings formed a unique architectural style of Taiping town. There are several vital social infrastructures such as railways station, rest house, chapel, school, association, and hospital. These infrastructures and facilities constructed during the tin mining industrial era that is to support the tin trade, commercial centre and also local people way of life. The British colonial administration buildings located much-closed distance to the colonist quarter's zone. Indeed, the colonial building such like District Office, Perak Museum, and Old Clock Tower became the eye catchy and sense of grandiose due to the building size, frontage, material, formality, and element (Figure 4.26). Home (1997) highlighted the colonial clock tower signified the colonist (or western) time discipline. Genuinely, the clock tower building designed as a focal point for the grid-iron town positioned at Kota Road and Tupai Road. The Old Clock Tower in Taiping town was conjugate conceived as the police station and rebuilt as a brick structure in 1881s (Taiping Local Council, 2013). In the olden days, the clock tower recognised as 'the fort', the gun placed on the opening rampart in the different orientation for the town's security.



Figure 4.26: Taiping Clock tower (left); Taiping District Office (Middle) and Taiping Pre-war shophouses (Author,2014).

There are 83 selected dominance Chinese old shophouses and clan association buildings and 17 unit civic buildings to be conserved by the Taiping Municipal Council (Taiping Municipal Council, 2010). Each heritage building in Taiping retains its distinctive character, function, colour, material, and the building's details structure or special decorative. In the town centre or the core heritage zone in Taiping, various patterns of Chinese shophouses formed a distinctive solid urban form and enclaves with the mixture the colonial townscapes. The post-war shophouses epitomised the evolution of Taiping town underwent tin industry and also pertain as importance Chinese settlement and commercial zone created by the British colonist.

These tangible heritage buildings are vitality to provide activity spaces. For instance, old shophouses and central market in Taiping was significant nodes for shopping activities and business. Therefore, the private and public spaces extensions in Taiping town are for informal street activities, mercantile, cultural event, and leisure. In short, a walkability distance in Taiping town was accessible for people movement from building space attached with other urban spatial such as the street, five foot way, the marketplace, and civic buildings. Hence, the heritage buildings in Taiping erected the most visible structure and urban colonial landscape to form the attention and sense of identity.

4.4 Comparison of Taiping, Larut and Kinta Valley and Sungai Lembing tin towns

Table 4.4: Comparison of Taiping, Larut and Kinta Valley tin towns;

Attributes	Taiping, Larut	Kinta Valley	Sungai Lembing
Geography location	<ul style="list-style-type: none"> Located at Bintang range; the North east of Perak. 	<ul style="list-style-type: none"> Formed by the Sungai (River) Kinta (a tributary of the Sungai Perak), 	<ul style="list-style-type: none"> Located on the East Coast Range.

		the valley laid at between the Keledang hill (formerly Kledang west) and Main (east) ranges.	
Mining administrative centre	<ul style="list-style-type: none"> • Taiping 	<ul style="list-style-type: none"> • Gopeng, • Batu Gajah and • Ipoh 	<ul style="list-style-type: none"> • Sungai Lembing town.
Mining operation period	<ul style="list-style-type: none"> • The richest tin producer in in Malay states by 1840 to 1890s 	<ul style="list-style-type: none"> • 12 to 16 Kilometre in width which is the richest tin valley in the world Ooi, 2004). It was the main tin producers in 1900s to 1980s after Larut tin depleted. 	<ul style="list-style-type: none"> • Mining operation in Sungai Lembing operated by PCCL Company (a London based company) from 1890 to 1986.
Composition of mining town (or site)	<ul style="list-style-type: none"> • Klian Pauh, Klian Bharu or Kamunting Simpang, Taiping, Tupai. 	<ul style="list-style-type: none"> • There are 22 small tin towns in Kinta district: Ipoh, Gopeng, Papan, Kampar, Pusing, Batu Gajah, Tronoh, Mengelembu, etc.). Gopeng located at the eastern edges of valley, was the largest town in Kinta followed by Ipoh and Kampar. 	<ul style="list-style-type: none"> • Three primary underground mining site namely as Willinks, Myah and Gakak.
Mining method	<ul style="list-style-type: none"> • Simple mining method worked by labour or 'coolies' at the mining site with hoe, and transported to a washing site, using baskets, where it was washed by hand (Plamer and Joll, 2011). • Cheap labours recruitment from China. The manual tin labour constituted 80% of the mining costs. • The Chinese lombong (or the hand mining method) which is worked by hand 	<ul style="list-style-type: none"> • Hydraulic mining method (the origin mining method in Gold rush California and Australia during 1850s). Followed by the gravel pump mining and bucket Ladder Dredging. • Gopeng Tin Company Limited was registered in Redruth in 1891s, the first company financed by Cornish company to mine alluvial tin in Malaya. 	<ul style="list-style-type: none"> • Initial mining method was the open cast mining and followed by the underground shaft mining.

	and carried using basket. Steam pump were used to keep the hole dry.		
Mine labours or 'coolies'	<ul style="list-style-type: none"> Majority Chinese immigrant Labour; initiated by local Malay (minority). 	<ul style="list-style-type: none"> Majority Chinese miners, Sumatran people (Mandaling & Rawa), Indigenous (<i>Orang Asli</i>) and Indian. 	<ul style="list-style-type: none"> The initial tin mining worked by Chinese, Malay, and Javanese. When PCCL company start operated, Chinese are the dominant tin worker.
Mining town spatial pattern	<ul style="list-style-type: none"> The first built tin town by British colonial in 19th century. The town zoning are: hill area, the lowland and the china town. Grid iron layout planning and street pattern (11 cross roads). There is a Hill station built at Larut Hill with tea gardens, vegetable plantation and bungalow building for retreat house. 	<ul style="list-style-type: none"> The mining town layout at the most Kinta mining town are irregular grid-iron patterns, linear and mix with the organic form. The urban pattern is much depended on the scale and function of the tin township. Spatial pattern accumulated from main zoning of Chines town area and native villages. Not all the tin town in Kinta Valley had British residency. 	<ul style="list-style-type: none"> Sungai Lembing is the only planed tin town at the east coast of Malaysia located at the hinterland valley of Kuantan River. The town have divided into commercial zone (Chinese habitant), the PCCL manager and employee quarter zone on top of the hillside, and the local villages.
Mining infrastructure	<ul style="list-style-type: none"> River was the important carriage system to transport tin ores from inland to the nearest port. Taiping connected to Port Weld (Kuala Sepetang. The railway lines completed in 1885s to tin ores export from Larut region to Penang. 	<ul style="list-style-type: none"> Railway network built from Ipoh to Tronoh in 1908s. This railway tracks connected to other mining town such as Menglembu, Lahat, Papan, Pusing and Siputeh. The tin ore exported via Telok Anson port. The North-south trunk road linked to Ipoh and Kuala Lumpur. 	<ul style="list-style-type: none"> Tram was used to carry firewood and to tin ore to the prier for shipment to Kuantan Port.
Heritage mining townscape or mining landscape	<ul style="list-style-type: none"> 33 of Taiping many firsts of (Perak museum, Taiping gaol, market etc.) Taiping Lake Gardens 	<ul style="list-style-type: none"> Giant water pipelines: Gopeng Hydo-electrical : plant Malim Mawar: Tin Dredge: Tanjung Tualang, Batu Gajah. It was 	<ul style="list-style-type: none"> Timber structure shophouse, PCCL manager house and PCCL employee house, labour share house.

	<ul style="list-style-type: none"> • Kuala Sepetang fishing village (the former Port Weld): Mangrove forest and the traditional charcoal making. 	<p>the started operated in 1913. The last tin dredge was built by Kuala Langat mining Sdn Bhd to mine an area south of the original Kuala Langat tin field.</p>	<ul style="list-style-type: none"> • Underground mine tunnel. • Rural landscape emergence by adjacent village settlement, Kenau River and the natural vegetation.
Ex-mining site redevelopment	<ul style="list-style-type: none"> • Housing estate • Lake gardens • Land reclamation for Taiping gaol, race course and museum. 	<ul style="list-style-type: none"> • Agricultural land. • Clearwater Sanctuary Resort, Batu Gajah • Reclamation for University campus • Abandon mining pond. 	<ul style="list-style-type: none"> • Mining museum opened in 2003 and underground mining site has restored for heritage tourism and education via the ex-mining's tunnel expedition.
Similarities townscape characteristics	<ul style="list-style-type: none"> • Chinese town was built in all the tin towns in Malaysia because of the tin miners are majority Chinese ethnic. • All tin towns have pre-war shophouses, townhouses, and colonial buildings. Basically, tin town built on grid iron street pattern but it depends on urban scale. Such as Batu Gajah, Papan and Lahat tin town layout is more organic and liner form. • Secondary economic support is the cash crop plantation such as rubber and oil palm. Agricultural sector became the main economic resources after the tin industrial declined or depleted. • Social facilities: early school, hospital, worship buildings, Chinese association, administration office (only available at the post-colonial administration centre). • Some of the tin mining town had turned into a ghost town and again confronted the issue of depopulation such as Papan tin town in Kinta Valley. • Most tin mining towns constructed entertainment facilities such as Chinese theatre (some located at the Chinese temple compound) and especially for those Chinese miners. • Current heritage regeneration approach at tin town is the conversion of pre-war old shophouses into Museum or gallery house exhibits tin mining history, artefacts, related photograph and mining method etc. Besides, the museum used for tourism promotion it was to educate local people on the historical of tin industrial heritage and the important of heritage conservation. 		

4.5 Taiping heritage conservation plan and guidelines

The urban planning system in Peninsula Malaysia is governed by Act 172 in all Federated States. Chua and Deguchi (2008) stated Malaysia planning system is under four stages specifically 1) Federal; 2) regional; 3) state and 4) local. At the local planning level, Taiping Municipal Council is responsible for the Local Plans and Special Area Plans preparation. In 1874, the Hygiene or Health Board was formed to administer Taiping town. The Board function was formulated to enhance the function of Taiping town itself. At present, Taiping is the second biggest town after Ipoh City. Taiping Municipal Council is located in Larut Matang District that includes 12 subdivisions: Assam Kumbang, Jebong, Tupai, Taiping, Pengkalan Aur, Simpang, Sungai Limau, Bukit Gantang, Trong, Sungai Tinggi, Batu Kurau and Kamunting.

4.5.1 List of development plans prepared by Taiping Municipal council

i. Larut Matang Local Plans, 2015

Prepare a detailed framework and development plan with provide maps proposed land use and control guidelines development up to the year 2015 with regard to the policies and strategies state into physical form by a combination of aspects of social, economic and the use of resources to achieve the vision of development ".

ii. Special Area Plans (*Rancangan Kawasan Khas*, RKK)

The special area plan prepared by the cooperation of the Federal Department of Town and Country Planning of Peninsular Malaysia, Perak state Town Planning Department, and Taiping Municipal Council. The purpose of structure plan preparation is to discuss the current issue in Taiping and to suggest a proposal for Taiping Heritage town through the in-depth focus group discussion. Initially, the special area plan (RKK) visionary is to achieve the rebranding and conserving Taiping as a heritage town and yet sustainable development towards the year 2020. The proposed buffer zone shown in Figure 4.26 comprises six division zones as i)Taiping uptown commercial zone; ii)corporate commercial zone; iii) housing zone; iv) mix-use development zone; v)government institutional zone; and vi)recreational and educational zone (Figure 4.27). The proposed of buffer zone is to control the new development of the building height, to preserve building façade and the building design guideline permitted by Taiping Municipal Council (MPT). The buffer zone designated denotes to Local Government Act197 [Act171].

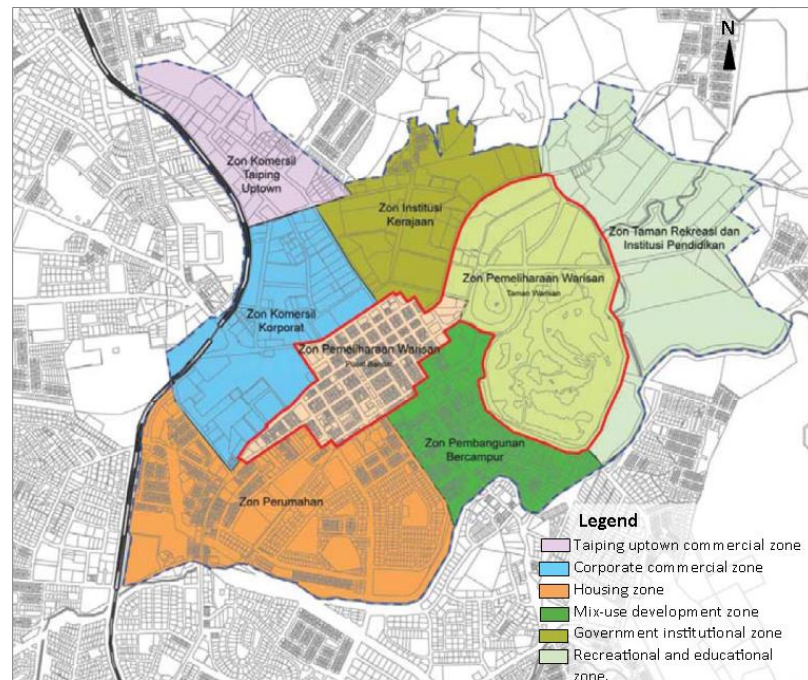


Figure 4.27: Proposed buffer zone and heritage conservation zone in Taiping.

iii. Urban Design and Heritage Conservation Guidelines (2008)

The urban design and heritage conservation guidelines prepared by Urban Design and Conservation Research Unit, Faculty of Built Environment, University Teknologi Malaysia. This urban design guideline is to generate a mechanisms development control to maintain the character of the Taiping City by preserving the origin value or urban fabrics with its cultural significance. The urban design guidelines contain the heritage conservations for heritage buildings, accessibility, visual quality, management and planning control.

4.5.2 Development of phasing plan in Taiping

There are seven proposals which had planned by Taiping Municipal Council follow the phasing plans year of 2008 to 2020. The proposed of comprehensive Taiping phasing plan project is bringing Taiping developed as a heritage town by protecting the heritage values and to conserve the dilapidated heritage building façade. Table 4.2 and Figure 4.28 illustrated the phasing plan heritage conservation for Taiping.

Table 4.5: Proposed phasing plan of Taiping heritage town.

Special area plan	Justification of Proposal	Remarks
1. Project 1: Heritage building preservation and adaptive reused for the art gallery, budget hotel, exhibition.	<ul style="list-style-type: none"> Proposed the heritage buildings preservation for 83 private heritage buildings (old shophouses) and 17 units' public buildings were identified by the Taiping Municipal Council where these old buildings possessed historical and architectural values to be preserved under the building heritage buildings conservation and restoration. 	<ul style="list-style-type: none"> Maintenance Preservation Restoration Reconstruction Adaptation and compatible use
2. Project 2: Proposed Kota Road as the main road	<ul style="list-style-type: none"> Proposed Kota Road as the protocol road via the key concept of 'shopping street' where to combine the linear road system integrated with town's activities. 	<ul style="list-style-type: none"> Streetscape improvement.
3. Project 3: Proposed cultural market and market square	<ul style="list-style-type: none"> A project of redevelopment the existing marketplace to a new market square for cultural and commercial activities. The adaptive reuse of Taiping central market to become a dry market, bazaar, antique shops, fruits stalls, flowers, snacks, gallery, and culture handicraft. 	<ul style="list-style-type: none"> Renovate the existing Taiping old market. Redevelop the market square to enhance social cultural activities in Taiping town.
4. Project 4: Upgrading the to local road	<ul style="list-style-type: none"> Proposed Pasar Road as art street, Station Road develops as the seasonal fruit street, and the Berek Road as night food and festival street. 	<ul style="list-style-type: none"> Adaptive reused old building and integrated with vibrant streetscape and activities.
5. Project 5: Proposed a town square	<ul style="list-style-type: none"> Proposed a new entrance square, heritage square, and historical square as a landmark place and to generate the welcoming sense for the visitor to Taiping town. 	<ul style="list-style-type: none"> The entrance gate of Taiping Heritage town should be upgraded in order to create 'sense of welcoming' and reflects the city's image as a heritage town.
6. Project 6: Proposed heritage trail	<ul style="list-style-type: none"> To promote Taiping heritage through the diversity heritage buildings and architectural design. 'Taiping Walk'. 	<ul style="list-style-type: none"> Proposed heritage Trail aims is to expose and promote the historic character of heritage buildings

	<ul style="list-style-type: none"> To strengthen the unique identity of Taiping town by introducing the 33 of Taiping Many Firsts. 	
7. Project 7: Proposed the development and beautification of Taiping Lake Gardens	<ul style="list-style-type: none"> Proposed mini golf course, tin mining museum (open cast mining museum), botany garden, heliconia garden, open courtyard (hibiscus theme) and aquatic garden. 	<ul style="list-style-type: none"> Concept to adopt the development of green areas or open spaces.

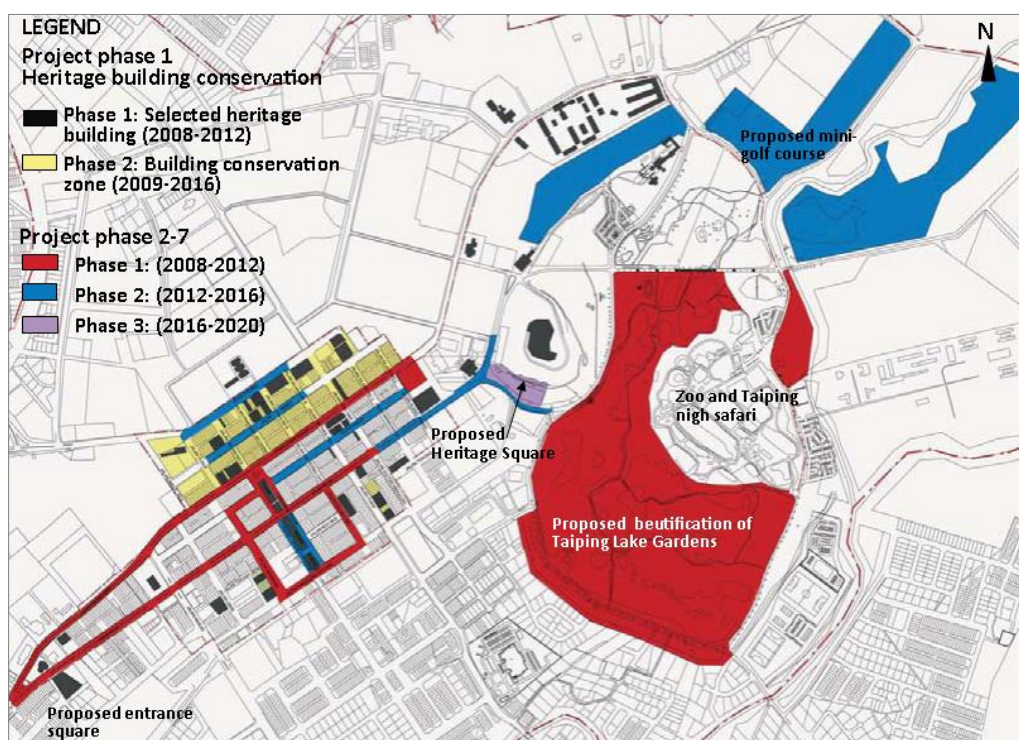


Figure 4.28: Phasing development plan by area (4 phasing plan from year 2008 to 2020).
(Source: Taiping Special Area plan, 2010)

4.5.2.1 Issues regarding to the Taiping redevelopment plan;

- i. According to Taiping 2020 Plan, the proposed redevelopment designed to put Taiping town to a modernise proposal.
- ii. Yee Seu Kai, a Taiping representative of Perak State Senator said a hundred units identified old shophouses for conservation through Taiping 2020 vision plan. However, Yee fortified that much more needs to be done to get local townsfolk to participate actively in conserving their properties. (<http://www.thestar.com.my/> March 27, 2011).

- iii. Need to think of a model of heritage town based on the opinions of local people. As mentioned by “Dr Lai stated Taiping’s resilient spirit is reflected in its continual transformation, from a tin mining town to vibrant commercial centre for rubber, a place for leisure and now as a heritage town.” (<http://www.thestar.com.my/> March 27, 2011).
- iv. There are some local people objections the redevelopment of Taiping old market that had affected the failure to preserve the physical and intangible heritage of the 140-year-old market. Eventually, some hawker will lose their generation market trade in that central market.
- v. Need to reconsider the entire redevelopment regards Taiping as an ex-mining town and also a colonial heritage town. In which the heritage redevelopment should be more sustainable and suit to the pace of local people lifestyle.

4.5.2.2 Local Non-Government Organizations (NGO) involved promoting heritage conservation awareness among local people.

Taiping and the northern regions states (Kedah, Perlis, Pulau Pinang and Northern Perak) are adopted in the Northern Corridor Economic Region (NCER) started from 2007 until to end of the 12th Malaysia Plan by 2025 (Source: <http://www.gotaiping.com/ncer/>). The main purpose of NCER is to fortify economic potential, income gap and create job opportunities. The NCER executed to heighten Taiping tourism and hospitality industry by building five new hotels up to 2016 (cited in Audrey Dermawan, September 19, 2013). Additional the project investment expected goes to Taiping food and beverage outlets, hawker stall, heritage trail, and Taiping Zoo. The collaboration in between Northern Corridor Implemented Authority (NCIA), Taiping Municipal Council and the Japanese government (JICA) offered two electric shuttle buses to support Taiping heritage trail project (Amanda Yeap, April 14, 2015). It is partly of the coalition with environmental sustainability cum heritage preservation. Henceforth the local and tourist able to visit 39 places in Taiping heritage town and the route take about 11.5 kilometres.

Due to the issues of critical heritage building demolitions in Taiping town, a cohort of local people had established a Non-Government Organisation namely The Taiping Heritage Society (THS) in May 2006. The main goal is to preserve the heritage significance of Taiping town which is gradually threatening and to imbue heritage benefits and education of future progeny. Taiping Heritage Society is undertaking the following missions to attain the heritage conservation visionary;

- i) To generate public awareness and support for heritage conservation to certify the persistence of built heritage.
- ii) To promote education and develop an understanding of built heritage to manifestation Taiping's history and identity.
- iii) To identify historic sites in Taiping and preserve the local history.
- iv) To organise the public and student heritage awareness programme through the heritage trails, talks, forums, seminars, exhibition, tours and so forth.
- v) To shape a strong, involved and committed membership.
- vi) To achieve and sustain financial independence.

Other than THS, there are varied government and non-government organisation such as Taiping peace initiatives, Taiping Tourism society, Perak Heritage Society and Malaysian Urban Conservation Initiatives: Heritage Taiping (MUCI) is advocacy and active contributed in Taiping heritage conservation. Taiping was declared by Prime Minister Najib Tun Razak as a heritage city in 2011, and the prospect of Taiping to become another world heritage site (source: Luc Citrinot, Etn, December 19, 2011). Moreover, there are several heritage buildings in Taiping and Matang area had converted into museum and galleria to promote Taiping urban heritage.

a) Ngah Ibrahim fort or Matang historical complex

This museum exhibited the artefacts associated with the historical chronology of Malay chieftain Long Jaafar and his son Ngah Ibrahim in the founding and opening of Larut mines. Moreover, the permanent historical items display including the Ngah Ibrahim fort (the current Matang museum) and the building used, building construction and the British colonial rule, Japanese Occupation, Matang Malay Teaching College and the Malay School.

b) Taiping First Galleria

The First Galleria is one of the old government building adaptive reused and converted into a private museum. The heritage building was initially used for Perak Trigonometrically Survey Office in 1891 and replaced by Taiping Municipal Office by 1930. It is now a history museum to exhibit Taiping tin mining history. There are many old photographs presented Taiping historic town characters, and the roles of British residents involved local politics, economic and tin mining town development. The galleria's open space and courtyard also display some artefacts such as diesel locomotive, red telephone box and an old trishaw.

c) Taiping's Old House Museum

The origin Old House Museum was a three-storey townhouse possessed by one of the Chinese merchants in Taiping. The old house is located near to the old market square. This imposing townhouse laden with the antique reminiscence collections, household utensils, old pictures, old press and house furniture (cited in Law Siak Hong, May 7, 2014). It was an unforgettable experience to see and comprehend the interior section of this heritage townhouse. The most fascinating are the shared history of the wealthy trader and family in Taiping.

4.5.2.3 Taiping local people participatory in heritage conservation programme

The interview survey of Taiping local community participatory (n=37) in heritage conservation programme divulges 89 percent respondents do not participate in any heritage activities in comparable only minor percentage showed local people interested take part heritage programme (11 percent) (Refer to Figure 2.29). Local people also shared their participatory in Museum Heritage event, building heritage programme and heritage organisation. 27 percent of respondents remarkable not participating in any heritage occasion without any comment. The percentage results indicated local people are not active to involve in any heritage conservation programme with the reasons by the means of less awareness (3 percent), interested but not participating in heritage event (14 percent) and no clear vision in heritage program (14 percent). Eventually, several respondents also express they are not interested and insufficient time to join the local heritage occasions with 16 percent respectively. Moreover, local people to react not clear on the heritage event initiative by Taiping Heritage Society. In short, the key factor that local community of Taiping deficiency in understanding the benefits of heritage conservation and the importance of community engagement to accomplish the heritage approaches.

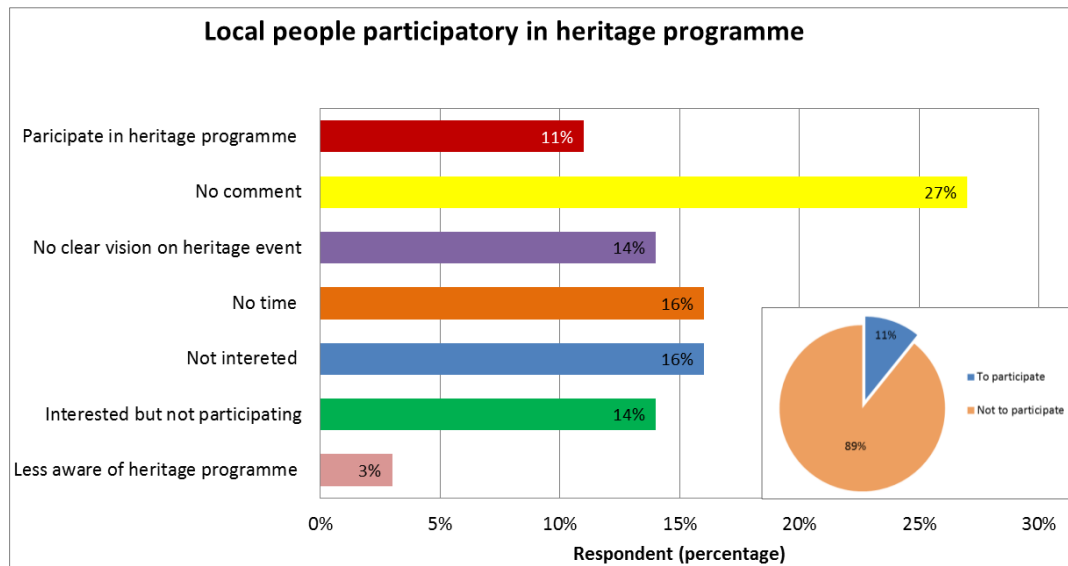


Figure 4.29: Taiping local people participatory in heritage conservation programme (Author, 2014).

4.5.2.4 Local people perception of Taiping as a heritage tourism town and living heritage town.

a) Local people perception on Taiping heritage town

Accordance to Taiping Municipal record, Taiping local plan was gazetted in 1st March 1996 based on the structure plan that outlined the cultural heritage and natural tourism. Through the interview with local people, the survey result exposed the high proportion of the local population (90 per cent) agreed Taiping to become a destiny of heritage tourism town in future (refer to Figure 4.30). Local people opinion to nurture Taiping become a heritage tourism town as the heritage potentials of the unique heritage buildings (old school, old shophouses, government heritage building and historical assets), thirty-three of Taiping Many First, enrich in historical stories, the first railway lines, and Kuala Sepetang (former Port Weld).

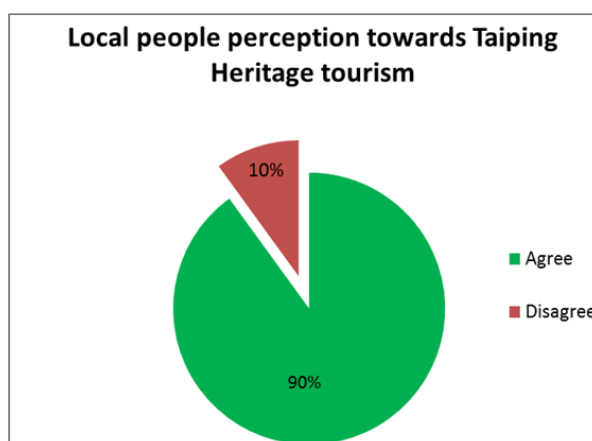


Figure 4.30: Percentage of Taiping local people towards Taiping heritage tourism (Author, 2014).

Taiping is an accessible and walkable town. Therefore, it was suitable for the heritage strolls where the visitor able visits the historical places in Taiping town centre. Also, the respondents also shared that once Taiping is emerging as a heritage town, it was the potential for Taiping designated to heritage town after Melaka and Penang recognised as UNESCO historic cities. In fact, the heritage tourism could help to conserve the vibrancy historical legacies supported by local government incentives, to control the piecemeal and urban development, and the upkeep Taiping heritage for future generation. In contrast, the result yet to reveal minor respondents who disagree (10 percent) Taiping develops as a heritage tourism town. The reasons specified by local people who concern the negative impacts on the heritage tourism will turn Taiping become a busy town and distracted the current peaceful living of the ex-mining town. Furthermore, the local over again addressed the old shophouses might change into new development and subsequently, the heritage relics in Taiping will be torn down caused by the inappropriate development and less financial support for the heritage conservations.

b) Local people perception on Taiping Heritage town;

Besides, through the interview analysis identified local people in Taiping with hundred percent votes and agreed Taiping is lively town through perceptual aspects (display in Figure 4.31). The pleasant and peaceful living factors achieved the 31 %, the highest percentage for the reason for local people to choose Taiping as a living town. The second influential factor because of Taiping was an accessible town, and strategically located in between Ipoh and Penang City (14 percent). Subsequently, other factors such as low living cost (13 percent), comfortable and cooling town (12 percent), and the pension heritage town milieu attracted people had chosen Taiping as a decent living place. On the other hand, Taiping living heritage

town reflecting the preferences of the unique landscape setting and scenic heritage town of Taiping (9 percent), no traffic congestion (5 percent), safety living (3 percent), and eateries (2 percent). Factor described above elucidates the physical townscape; heritage ambience and the distinctive landscape (Taiping Lake Garden, Larut Hill and Matang Mangrove Forest) is the main contributor behind of Taiping living heritage. In sum, to remaining Taiping as a peaceful living town, it is essential to control the future heritage conservation and heritage tourism in the modest development.

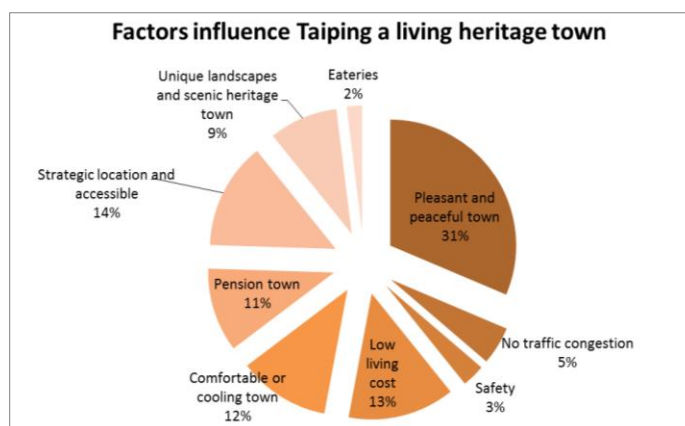


Figure 4.31: The chart shows factors that influence Taiping as a living heritage town. (Author, 2014)

In addition, there are suggestion and feedback given by the local people regarding Taiping heritage town future development. The ex-mining town community concerning the future development of Taiping impacts by rapid urban development and economic encroachment. At the same time, there are advantages of heritage tourism, local heritage values and Taiping prospect described in Table 4.6.

Table 4.6: Local people perception on Taiping future development

Local people perception	Descriptions
i. To control new development and to protect Taiping heritage	<ul style="list-style-type: none"> • New light industrial fast develops at Taiping peripherals therefore, Kamunting will be more develop. • Remain Taiping as a liveable city. • The adjacent new development might affect Taiping heritage conservation. • Population are increasing demand for new housing. • To control the fast development and keep Taiping as living place for pensioners. • Concern related industrial to Taiping development.
ii. Enhance Heritage conservation	<ul style="list-style-type: none"> • Inadequate heritage conservation plan in Taiping endured the failure of replica railway restaurant in Taiping. • Suggest Taiping a comprehensive heritage conservation

in Taiping.	<p>strategy and management.</p> <ul style="list-style-type: none"> • Local people should reward incentive benefits from heritage conservation. • To encourage local people further understand and appreciated the cultural heritage preservation. • Taiping possesses 33 of many first. • A proper conservation plans for Taiping Larut Hill. • Preserve Taiping Old Market. • Remain Taiping heritage building especially the building façade to protect the town's identity. • To remain the heritage ambience of Taiping town.
iii. The potential of Taiping being town heritage tourism.	<ul style="list-style-type: none"> • Tourism sector helps to boost Taiping economic and job employment opportunities. • Taiping had the advantages of developing in tourism sector because of the unique heritage.
iv. Impact of new economic development	<ul style="list-style-type: none"> • Suggest a university or education institution for Taiping development in future. • Too many new commercial and shopping centre surrounded area affects to the retail shops and urban conservation. • The new commercial structure is gradually replacing the heritage building.
v. Facilities	<ul style="list-style-type: none"> • New housing scheme expansion at Taiping town peripheral to remain the core heritage centre.

4.6 Justification for Taiping tin mining town characteristics

4.6.1 Tin industrial is the oldest industry heritage in Malaysia

British colonial imperialism began to control the tin deposits in Malaya by 1874. Tin became an important raw material for the industrial revolution. In the 19th century, tin plating demand increased, therefore, the tin deposit in Southeast Asian become familiar (Palmer and Joll, 2011). The located in the south eastern Asia tin belt laid from Yunnan, China to Malay Peninsula. Hence, historical and geographical setting of swampy alluvial had placed the Malay Archipelago disclosed into the world tin trades. The impacts of tin industrial are: the increased of small town growths, economic expansion, infrastructure development and the growth of populations in Malay Peninsula. Simultaneously, tin booms accelerated many tin towns or tin settlements built during the tin rush era in 19th to 20th century. Perak state is the richest tin deposits district where Larut mine is the main tin ores supplies for export.

4.6.2 Mining settlement and social infrastructure

Taiping Township was the first planned tin mining town influenced by British colonial town planning and mixed with native and Chinese architecture townhouses. The notable townscape components are the wide street (thoroughfares), grid-iron street pattern, public open spaces (Padang or esplanade), and rectangular plots layouts. Besides, another social infrastructure comprises the school, religious houses, associations, and public offices to support the miners since the 19th century. These social infrastructures became essential heritage properties for people daily uses. The tin mining settlement and built heritages virtually signifying mining landscape characters and industrial components. Indeed, Taiping's thirty-three many firsts had listed as national heritage under The National Heritage Act 2005 (Perak Heritage Society, 2015). Also, with the evidenced of Larut land use transformation process and Taiping tin town construction during British colonisation period (18th to 19th centuries), Taiping township became a typical early tin town in Malaysia and Southeast Asia region.

Succinctly, the social diversities and cultural values carried out as core attributes of mining landscape evolutions in Taiping. By means of this, the mining landscape has presented the cross-cultural of western's town planning combination with the east ethical attributes. Although the segregation boundary is discernible on the entire tin town layout, as today Taiping tin town reveals, the multi-ethnics are living in the historic colonial townscape ambience. The significant tangible and intangible heritage resulted in the past tin industrial society and tin mining town development.

4.6.3 Mine transport: industrial railway lines

Initially in the early 19th century, rivers and the bullock cart roads were the main mine transport to deliver tin deposits from the mining camps. The railways transport was constructed to ease the process of transporting a large amount of tin ore to the seaport. Taiping-Port Weld was the first railway lines built in 1885 and consequently the railways network linked to other mining towns. The rail system plays important roles not only used for the tin industry but the agricultural crop. Unfortunately, Taiping-Port Weld railway was dismantled after the tin ore exhausted and yet the impact of urban development. In which, has explicating industrial railways conservation is crucial in remaining the tin industrial heritage property. The mine railways erection evidence of the significance western modern technology has conveyed to the process of the tin industry in Malaysia.

4.6.4 Ex-mining lands transformation

The relics of industrial landscape in Taiping can be traced through the ‘landscape designed that created intentionally by human not restricted to professionally train architect’ that was known as designed landscape (Stuart, 2012). The land use and ex-mining lands changes had shown the culture impact on the tin mining settlement construction and the landscape modification. In such, the ex-mining lands in Taiping have converted for monumental building used, there are: Perak Museum, Taiping prison and race course. As well as the Taiping Lake Gardens located at the eastward of Taiping town was reclaimed from the ex-mining ponds and designed as a public park. Chung Thye Phin donated the ex-mining ground, was a wealthy Malayan tin miner. The Residency and golf course was found in the northern part of the Lake Gardens (Ho et al., 2010). They are several individuals such as Leonard Wray (the Superintendent of Government Hill at Larut), W.R.Scott, the Inspector of Mines, Frank Sweethenham and his wife, Constance Sydney Holmes contributed to the design, landscaping and the beautification of the garden (Alex, 2014). Taiping Lake Gardens completed in 1884 with the magnificent heritage rain trees and Maxwell Hill (Larut Hill) as the natural backdrop for the public garden. In short, Taiping ex-mining town encompasses not only the settlement moreover the integrity of the aesthetic garden landscape.

4.7 Conclusion remarks

Taiping was the first British-built tin mining town in Malay Peninsula. Therefore, the colonial inheritance townscape derived from the tin mining industry and colonial urban planning. The British colonial planning has turned Taiping to become a comfort and leisure ‘English town’ where the man-made lake garden, open green spaces (Padang), the gridiron street, English landscape, European settler houses and hill stations built for the British elites and workers. The impacts of Taiping planned as a colonial town with the public open spaces, recreational, sports area and western social lifestyles created a new layer of postcolonial townscape. By the meantime, the colonisation and the industrial tin settlement had influenced and changing local people lifestyle. In such, local people utilised and engaging to the postcolonial landscape and facilities likewise the former colonial building, hill station, cricket field and recreational Public Park. The urban form and the components of Taiping town deliberate the colonial town features elaborated in the Grand Modell of colonial settlement in Home (1997) and the tin settlement growth in (Ooi 1963; Kohl, 1978; Khoo 1991; Masron and

Yaccob et al., 2012; Sunderland, 2014). Indeed, the physical and social changed and multi-cultural (mixed western, Asian and native) enacted Taiping a colonial tin industrial town.

Secondly, Taiping tin mining town characteristic examined through the tangible heritages allied to tin mining industry and the ancillary tin mining town development;

- a) Tin mining town settlement covers the commercial centre (Chinese shophouses), British quarters, government building, Chinese townhouses, miner houses and other facilities.
- b) Railroad transportation networks (The first railroad turned Taiping become a flourishing tin mining centre. Likewise, the Kinta Valley tin ores sent to Taiping town via Port Weld before sent to Penang for smelting. The railroads expansion from Taiping connected to Ipoh by Victoria Bridge.
- c) The lake garden is the conversion of reclaimed mining field. Simultaneously, the man-made pond functioned as a water catchment complement with the township drainage system for the sanitary and flood prevention.
- d) Taiping Township is the only mining town closed to the Larut Hill station. The hill station resembles an English model of hospitality and the highland landscape.
- e) Taiping urban fabrics composite the mixtures of the eastern culture landscape (the Chinese East Asian architecture mixed with the Malay native traditional house design), western town planning and colonial townscape.

Malaysia tin mining town shares the mutual character and features erected by geographic setting, postcolonial urbanism, Chinese settlement (or Chinatown) built at the middle part of a mining town, and also the constitution of multi-ethnics society. The same aspects of Malaysia's mining town are listed as the follows;

- a) All mining towns have shown the typical characteristics of British colonial town planning. The colonial town planning evidenced by the gridiron street layout, wide street (or thoroughfares), colonial buildings, and western residency.
- b) The functions of Malaysia mining town as a tin settlement, commercial centre, transportation hub for tin export and retail goods distribution.

- c) The Chinese old shophouses and townhouses were the essential heritage townscape of a historic mining town. It was the early township fabrics and the key indicator for the tin industry urbanisation in Malaysia. The cluster of traditional shophouses concentrated in a town centre formed the fine-grain urban form of a mining town.
- d) The wide street design or 'thoroughfare' laid out on the grid-iron pattern and the branches road connected to the adjacent mines. In addition, the wide street in a mining town planned by the British colonist to prevent fire spread and the sense of surveillance towards the mining settlers.

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CHAPTER 5

ANALYSIS, FINDING AND DISCUSSIONS

5.0 Introduction

The chapter on the analysis, finding and discussion divided into three sections. This chapter is to indicate Taiping heritage tin town was characterised by the historical background, physical spatial pattern, and social structure integration via tin industrial development. First, is the historical background analysis on the chronological and history of industrial heritage via descriptive analysis. Subsequently, the evolutionary transformation of tin town and mining landscape examine by the Larut district land use mechanism and tin town urban morphological pattern. In such, the physical pattern of a tin mining town and its industrial landscape formation show the successions tin industrial heritage had changed the landscape over the time. At the meantime, the analysis and discussion of the social structure construction during the tin industrial period in Taiping town will be outlined in this chapter. The multi-ethnic compositions and the related spatial pattern have continued the unique plural society and cultural characteristics to the ex-mining town. Therefore, historic townscape analysis supports the understandings of the most valuable and significant tangible and intangible heritage of Taiping town. Furthermore, the finding discussions are based on the explorative data to discourse mining town assessment via tin industrial mining landscape progression, tin town transformation, socio-cultural structure and post-colonial townscape studies. In sum, the validation findings and discussions of this chapter contributed to the determinants values of mining town for cultural heritage conservation that is the important discussion for the conclusion chapter.

5.1 Evolutionary transformation of tin town and mining landscape

5.2.1 Mining Landscape Mechanism: Land use analysis

The succession of landuse mechanism depicts the lexicon terminology of industrial mining landscape. With the identification of tin industry evolutions, Larut and Taiping geographical settings have modified and turned into the post-industrial landscape and tin town settlement. Primarily, Taiping town is positioned at the foothills of Bintang Range. The natural topographical of tin belt and streams settings had moulded a flat delta that covered by tin alluviums where the Larut district is located (illustrated Figure 5.1). In the early period of the tin mining industry in the 1840s, Larut River was the main water carriage for to transport tin deposits collected from Klian Pauh, Klian Bharu (currently known as Kamunting) and Topai in Larut District. During the Dutch and Portuguese occupations in Melaka port city in 1641, a trading or commerce station situated at the river mouth of Perak and Selangor River are used for tin storage (Chai, 1964:163). Therefore, Larut River functioned as the dependable coastal and river estuaries for the water transport and tin trade routes (Leinbach, 1975). All the mining fields connected to Larut depots and estuary (refer to Figure 5.2). Khoo (2003) described, although there was an accessible route at Larut hinterland, the waterways cut through the river for tin ores loading and then passing through the canal of Teluk Kertang. Hereof, the key mining landscape compositions during the pre-industrial mining were the mining sites, scattered hamlets and rivers. These mainstreams at the mining areas functioned as the irrigation system, water supply for mining ponds and the open cast mining methods.

After Pangkor Treaty engagement, Taiping is promptly developed from the pro-growth in 1874s and the urban development steadily slowdown in 1895s (Taiping Municipal Council, 2013). In consequently, Taiping's township boundaries demarcated by the gridiron streets and built form (Isa et al., 2013.). British had introduced the garden city town planning interpreted into Taiping Township. During the peak tin industrialisation period, the first railway lines were constructed to connexion Taiping town with Port Weld seaport. Port Weld is located at Matang estuary which is enclosed by the mangrove forests indicated in Figure 5.3. Simultaneously, the first road has constructed in between Taiping and Klian Pauh's mining field. Due to the rapid urbanisation began in Taiping; the ancillary facilities had built comprising the religious building, hospital, school, esplanade (parade ground, sports activity and cricket and so forth), public square, entertainment, club house and cinemas) and the Maxwell Hill station. The rapid urbanisation and the vast urban transformations had converted the ex-mining lands into Taiping's gaol (1879); and the former government buildings had converted into Perak Museum (1883). Later, the ex-mining lands rehabilitated and converted

into Taiping Lake Gardens function as a Public Park (1884). Also the remarkable European elite entertainment which is the Taiping Race Course was completed in 1885s. Hence, the image and physical urban form of Taiping town was enhanced by the colonial buildings, wide street (thoroughfares), colonial landscapes, clock tower, and Chinese townhouses. All the buildings layouts were laid parallel on the eleven cross streets and four main roads in Taiping town centre. Aforesaid, the unique mining landscapes of Taiping tin town congregated by the tin settlement, hill station, recreational parkland, the grid-iron spatial form and other physical built environments.

Conversely, Taiping tin economic was facing declination in 1901s when the tin outputs were ceased and followed by the declining of Port Weld after 1910s. Taiping economic sector was slowly replaced by the rubber industry. In the nutshell, the expansions of crops whereas rubber plantations increased at the peripheral of Taiping town which is shown in Figure 5.4 land use map. Khoo (2003) stated the rubber commodities had supported Taiping residents' livelihood who worked on goods transport services after tin depleted. In the 1930s, Port Weld's economic had recovered when the increasing of rubber exports and the thriving of charcoal and firewood industry. In the Japanese occupation periods in between 1941s and 1945s, Taiping became a centre of Japanese military administration. After the World War II, Taiping had confronted another declination when Ipoh became the new capital of Perak (JPBD, 2005).

Later in the 1950s the Malayan Emergency, new village's settlement or Chinese New Villages were built by the British for anti-communist war. Aulong and Kampung Buoyan new villages erected on the ex-mining lands located proximately to Taiping. Currently, Taiping is recognized as a Heritage town, and the special Area Plan gazetted in 2010. It was the capital of Larut, Matang and Selama district in Perak. Taiping heritage core zone aggregated of 629.37 hectares while the buffer zone covered 145.84 hectares. The main land uses are the government institution, settlement and commercial area. Taiping adjacent developments included the new housing schemes, light industries, palm oil plantations and rubber estates (Figure 5.5). Concisely, the landuse structure and landscape evolution transformed the historical series of the tin industrialisation revolution, mining town urbanisation and the agricultural land expansion.



Figure 5.1: Taiping is situated on Larut plains (Author, 2014).

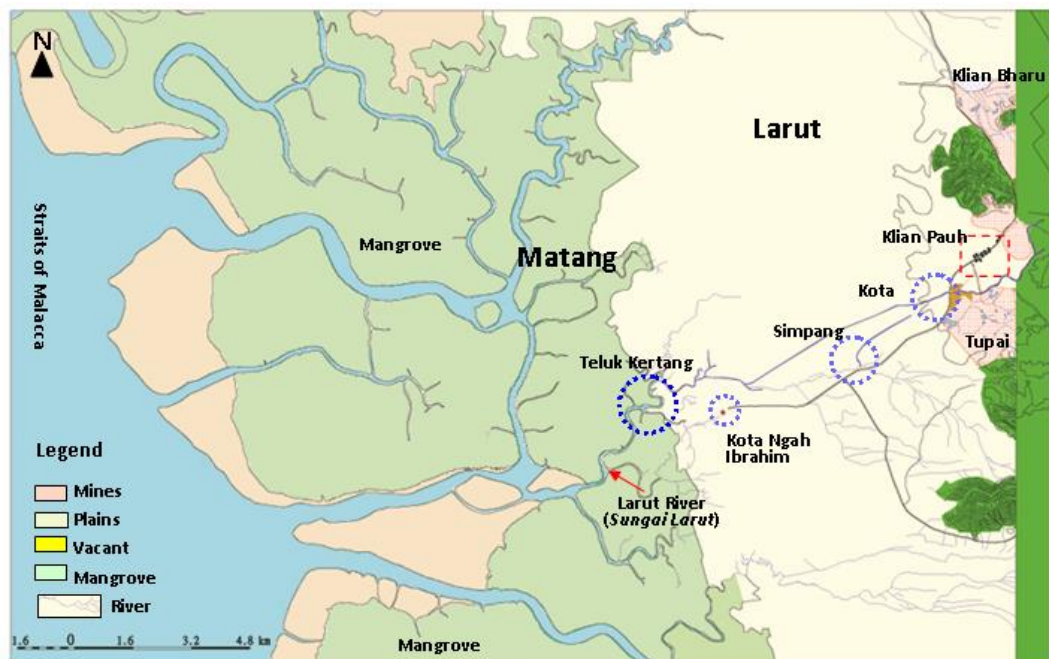


Figure 5.2: Early mining sites at Larut, rivers used to transport the hinterlands tin ores. (Author: 2014).

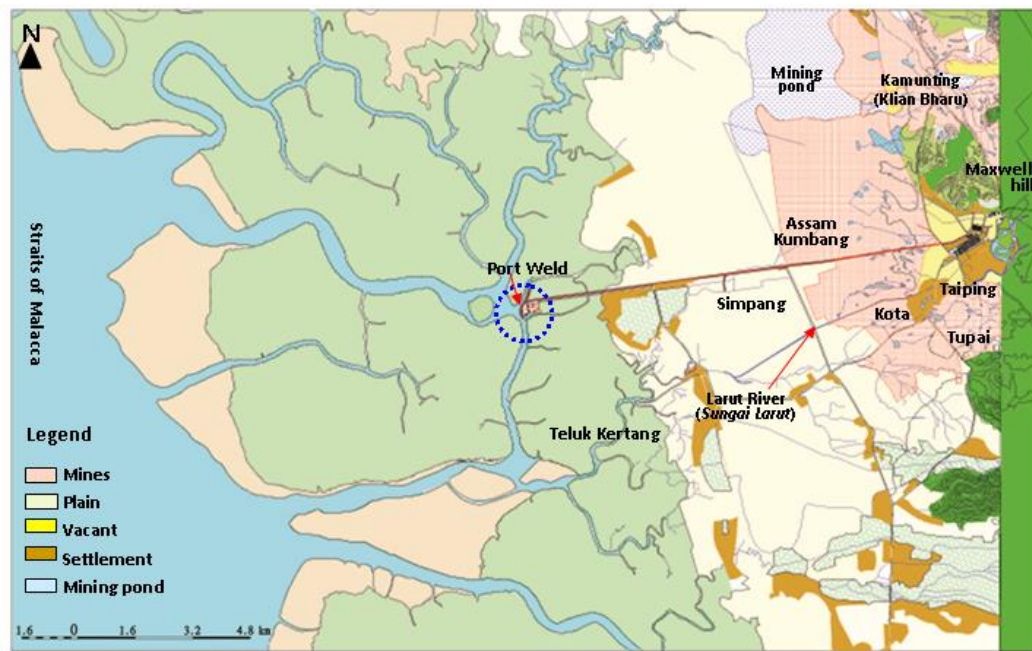


Figure 5.3: Taiping town was established during tin blooms era in mid-19th century (Author: 2014).

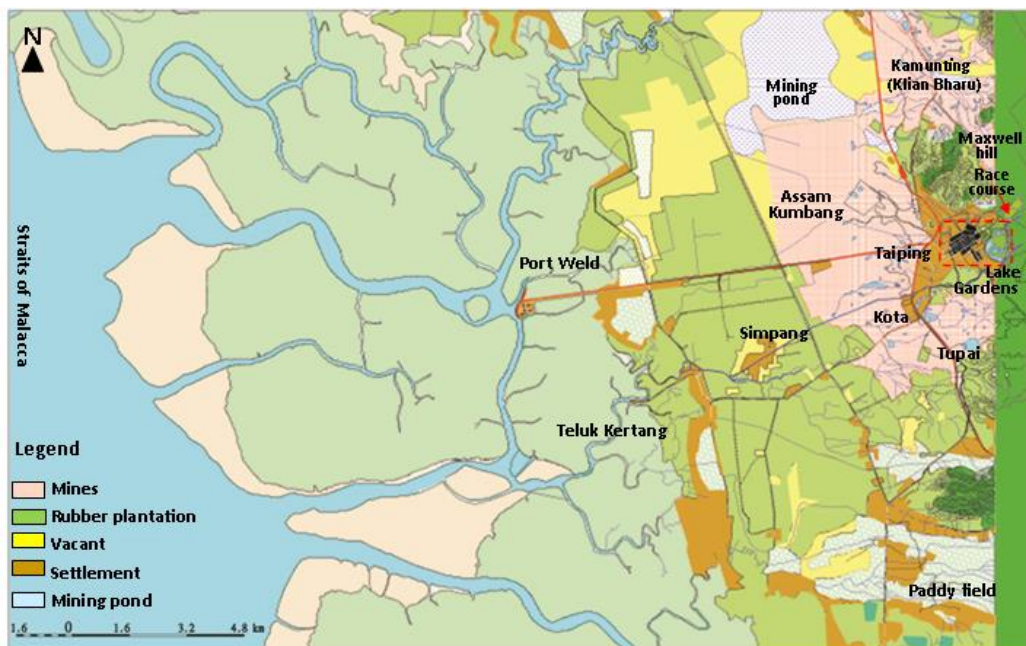


Figure 5.4: In late 19th century, tin depleted and gradually replaced by cash crop plantation (Author: 2014).

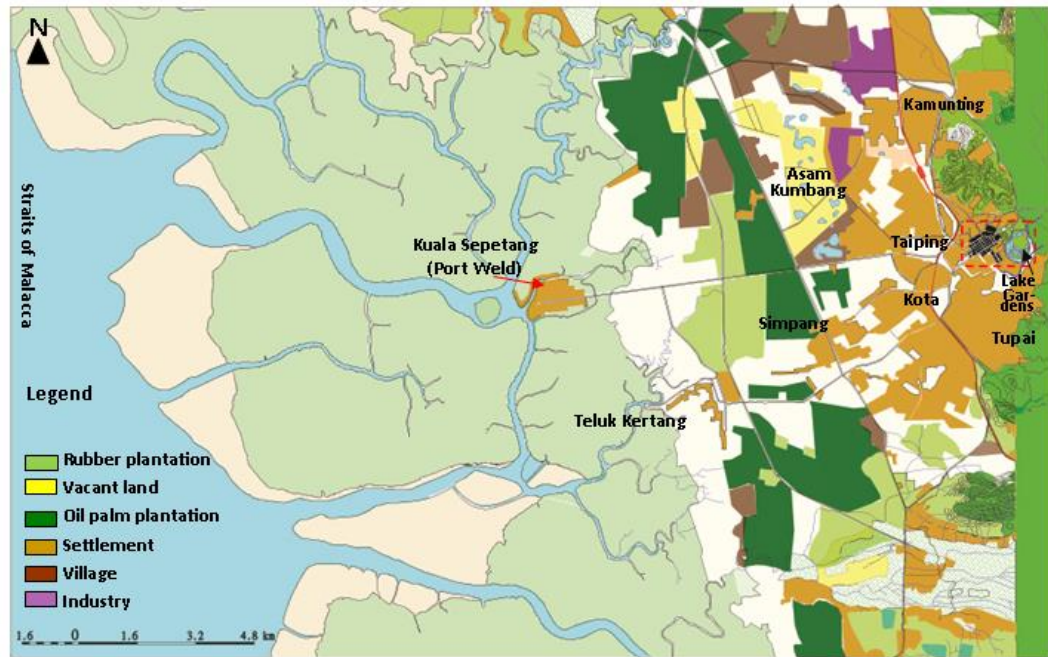


Figure 5.5: Current land use pattern of Larut, Matang and Selama district. (Author: 2014)

On the other hand, Taiping is now facing the built heritage dilapidation and incompatible heritage building usage. Through site investigation, the British residency (Casuarina Inn) and railway rest house were abandoned. 131-year-old wooden structure central market will be closing soon to replace with a new marketplace project. Moreover, the most precious first railway track in Malay states had gone since the 1980s. The first industrial railroads vanished which is how the mining landscape had changed over the time. Notwithstanding, the past legacy is an important notion of cultural landscape (Sirisrisak and Akagawa, 2007). It had verified that Taiping had been changing steadily and meanwhile, the status of heritage mining town and post-mining landscape was being concerns for safeguarding. Still, without appropriate heritage management and protection guidance, the cultural heritage values and tin town identity might deteriorate. The value of a place's cultural heritage or heritage significance inscribed in Burra Charter is imperative for the past and present heritage conservation and management (ICOMOS, 1999). Therefore, cultural heritage values of a heritage mining town are crucial to remain and prolong Taiping's cultural identity and living heritage. In sum, it is crucial to conserve relics of the industrial town and landscape instead of letting the priceless historical properties deserted.

5.2 Morphological urban form of Taiping tin town

Urban form in Taiping tin town is conjunction with the tin industrialisation and successions township development in the 19th century. Taiping is one of the oldest towns in Malaysia aged 141-year old derived from the interesting urban history on how a mining town built during the tin industrialisation. Shuhana and Ahmad Basri stated the historical and urban morphology studies interrelated to urban layout and structure including the town's backgrounds, growth, and function (cited in Shuhana, 2011). Thus, Taiping tin town's urban morphology evidenced thru the urban fabrics particular of the Chinese old shophouses, colonial buildings, wide street layout, plot and open spaces distribution that exemplified on the four morphological maps (refer to Figure 5.6 and 5.7).



Figure 5.6: In circa 1840s, early settlement located at the main road to Klian Pauh mines (left) and Taiping was developed as tin town after Pangkor Treaty agreement in 1874s (right).

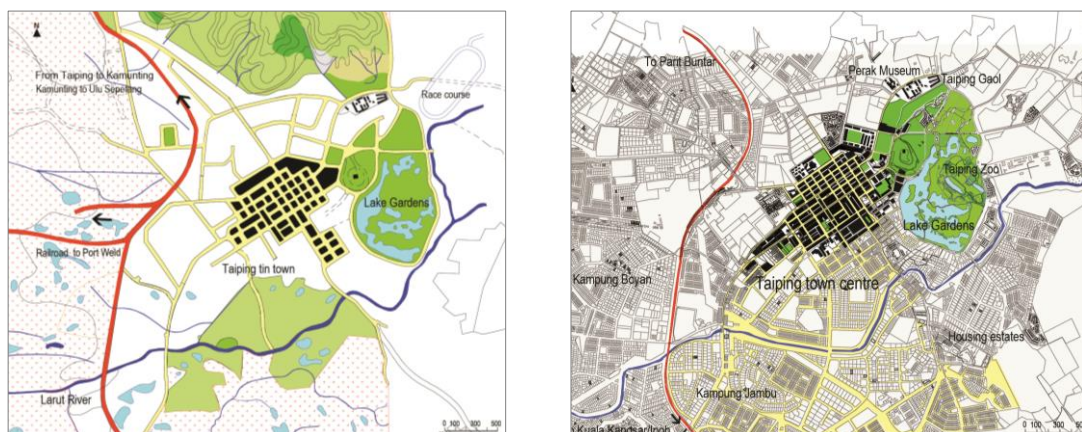


Figure 5.7: Taiping tin town is undergoing rapid growth in 1880s (left) and the modern Taiping town (right).

The first cart road built to connect the early mining site at Klian Pauh and Assam Kumbang initial operated by Malay Chieftain Long Jaafar in the 1840s. The early mining camp had constructed and positioned parallel to the main bullock cart road, it was situated on Larut plains surrounded by mining fields, hamlets and the primary tropical rainforest (Figure 5.6-left). Chinese mining labours from Penang were hired by Long Jaafar worked in Larut mines and gradually Chinese population increased in the 1850s. Early mining dormitory, a temporary building built vicinity to the mining site (Ooi, 1963). Hence, the landscape pattern of Larut district mainly was undeveloped land and yet in remaining with the natural landscape of lowlands and estuaries elucidated in Figure 5.8. During the tin industry transitions period, the establishment of Chinese labour house or Kongsee dormitory from differentiation clans were getting larger. Eventually there was fought among Chinese secret societies caused to the chaotic Larut Wars from 1861s-1873s. In between the feuds, many mining camps and tin fields had been destroyed till British colonial ruled the first political invasion in the Malay States to establish a new township and boundary namely Taiping by 1874s. Subsequently, the new township of Taiping has transformed the tin town and built environment into the gridiron streets, shophouses, marketplace, colonial quarter and administration centre (Figure: 5.6-right). New roads and cross roads were built such as Chung Thye Phin Road, Station Road, Kota Road, and Market Road, connected to Taiping and Parit Buntar (located in the north-west of Taiping).

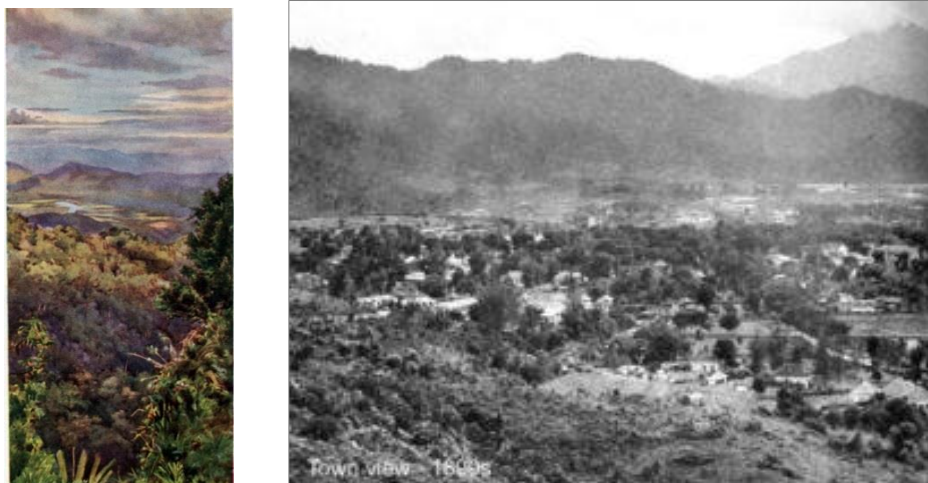


Figure 5.8: Landscape view of Larut plains and estuaries from hill top of Maxwell Hill (Larut Hill) (left) and view of Taiping town development in 1890s. (Source: Harrison (1923:53) <http://chungsite-roots.blogspot.>)

By 1880s, during the tin rush prospering had driven Taiping tin mining town expansions with the railway networks, seaport, road communication, social infrastructures (e.g., school, hospital, chapel, prison and so on), government offices, and shophouses (Figure 5.7-left and 5.8). All infrastructures were built which is to improve the inland urbanisation of

mining town mentioned by Sidhu (1976) and Kaur (1985). The organisation of urban pattern in Taiping tin town allocated by the 'Chinese town' and marketplace situated juxtaposition in the town centre. On the contrary, the colonial realm had separated administration offices and their living quarters on the northeast of Taiping. A hill station situated on the top of Hijau range, a virgin jungle had opened by British colonial in 1884s. It was the recognised as Larut Hill or Maxwell Hill (sea level approximately 1,250 m (4,100 ft). Herein, Taiping was not merely functioning as a British mining centre or tin settlement; nonetheless it was a European residency for retreat, sport and leisure. Before early 20th century, the urban fabrics of Taiping town made-up by Taiping Lake Garden, golf course, race course, Esplanade (Padang means field), military barracks and clubhouse. Besides, these open spaces used for recreational, politic or socialisation by the British, the land uses substantially to balance the solid urban form in Taiping downtown. As mentioned by Shuhana (2011) Padang is the most attractive urban space wherein to pertain as a formal setting and 'green lung' to the dense civic building and in the middle of heritage town in the Malaysia. The open spatial have reserved for the English landscaping, the greenery environment and the sense of void in the tin mining town that had continuous to present Taiping (Figure 5.7-right). Further, the magnificent colonial buildings such as Taiping Land Office, Perak Museum, Clock Tower, Saint's, King Edward's School, Anglican Church and the Rest House created distinctive English architecture and physical townscape for the proportionate between the green area or open space and built environment.

Taiping was in the slow pace development after tin ores began exhausted in the 1890s. After circa fifty years of tin mining activities in Taiping, a mining ground had transformed successively into differences phases of tin industry periods. Rubber industry helped to sustain Taiping's economic till it was retaining as a commerce town. The postcolonial heritage remains of colonial townscapes, heritage buildings and the spatial pattern has characterising Taiping as a distinctive heritage town. The semi-nature public garden and historical relics sustain Taiping in as a peaceful and relaxation town also notorious as a pensioner's paradise. Although the old building blocks are remaining, several heritage buildings are in the dilapidation condition. Simultaneously, the urban fringe area of Taiping town such-such as Kamunting, Assam Kumbang, Simpang and Topai were now a mix-used development or a housing neighbourhood.

Thru the finding, Taiping's urban morphology pattern has changed accordingly to the land use transformation of Larut valley into a tin mining township over the period in 19th century during the first British invasion in Malay States politic. The impacts of tin mining industry has enduring Taiping changed in demographic status, economic, infrastructure. In

which, the tin industrial heritage has impetus Taiping is now standing as a heritage tin town with commercially function. Moreover, when the tin industrial process had taken place, justification of industrial spatial associations with the industrial settlement and transportation linkages are essential to show in the industrial heritage study ascribed by Palmer and Neaverson (1998). Likewise, Taiping town structure and setting had respond to the geographical position, historic related background (Pangkor Treaty 1874), tin industrialisation movement and the deliberation of tin town planning by British colonist who put on the tin industrial primacy. Taiping ex-tin town possesses the equilibrium natural element (Larut Hill), green open spaces, and the heritage build form lay out on the grid iron streets (Refer Figure 5.9). It was found that the highest percentage of current land use in Taiping is the green open space and recreational area (40.34% or 58.83 hectares) (Taiping Municipal Council, 2010). Aforesaid, the postcolonial townscape and colonial urban planning unveils Taiping as a unique tin mining town with the green area compound and social infrastructures.

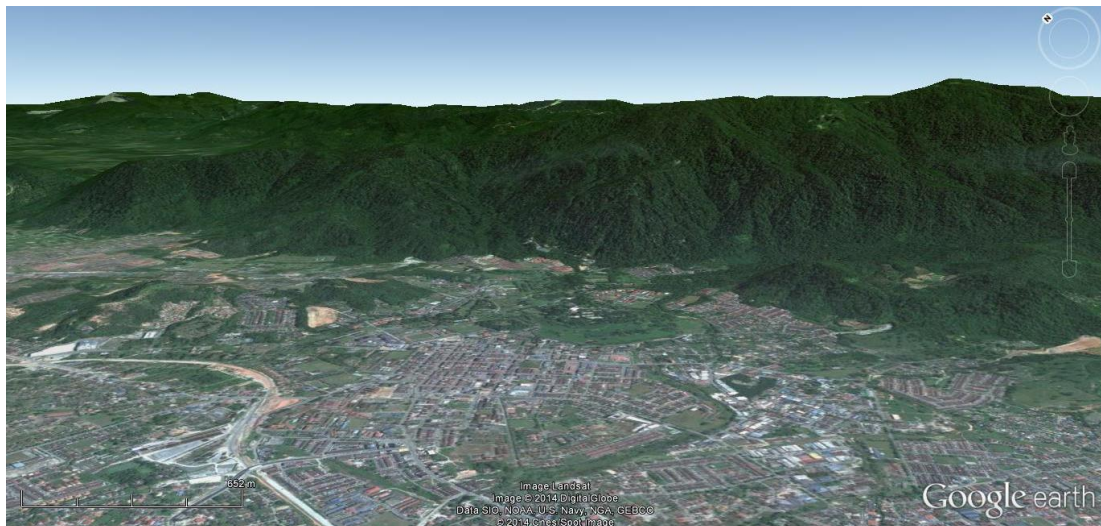


Figure 5.9: Larut Hill interprets to acquaint as the natural landmark to Taiping town (Source: Taiping, Perak, 2014)

5.3 Drainage system in Taiping

Taiping has proper drainage and sanitation system designed after the town was re-planned in circa the 1880s. It had evinced thru the drainage lines shown on the town plan in early 1900s (Ho et al., 2010). Taiping situated at the foothill of Larut Hill and received 200 inches rainfall in yearly which is the second highest rainfall area in Malaysia (Ibid, 2010). Taiping town built on lowland, when the natural climatic phenomenon interactive with the cold and warm breezes in Kuala Sepetang (located at the west coastal) influenced Taiping to

receive most rains all the times. For this reason, Taiping ex-mining town is also well-known as a ‘rain town’ or ‘raining town’. Moreover, the local people played a betting game related to the rains prediction in Taiping town. Since the olden days, before the rain come, the ‘gambling culture’ draw people to gather at Taiping central market to observe the skies for rains.

The hydrology cycles and storm water system occurred in Taiping when the rain water first flows through Taiping downtown and canal before discharge to the nearest riverine area and water catchment basin. The concrete monsoon drain laying out in Taiping town are with the open or covered drainages. The wider drainage design is efficiently and propitious for the rainwater runoff through the central gridiron streets located at Taming Sari Road, Kota Road, Station Road, Theatre Road (Jalan Panggung)and Market Road. Initially, the water flow from Larut Hill subsequently diverts into the lower ponds (Alamanda Pond and Island Pond) at Taiping Lake Gardens. These man-made ponds are vitality to collect the heavy water flows from the streams and upper ground of Larut Hill. Water weir is fixed to control the water level in the Lake Gardens ponds (Taiping Municipal Council, 2010) (shown in Figure 5.10). In additional, the traditional grass swales were placed at the Lake Garden’s compound to discharge overflow water from the ponds and then passing to the Taiping downtown (Figure 5.11). Taiping Detail Area Plan report described certain the some of the grass swales had replaced with the new culvert drainage after the upgrading drainage channels in Taiping Lake Gardens.

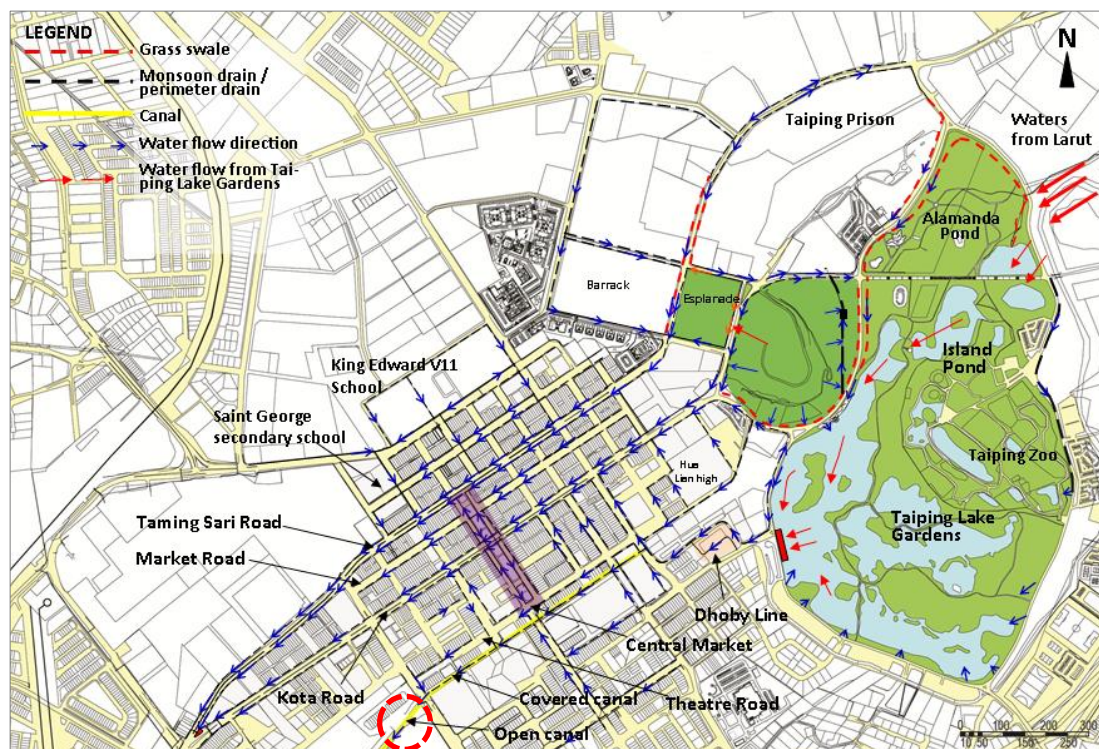


Figure 5.10: The drainage system and water flow schematic plan in Taiping town centre.

(Author, 2015)

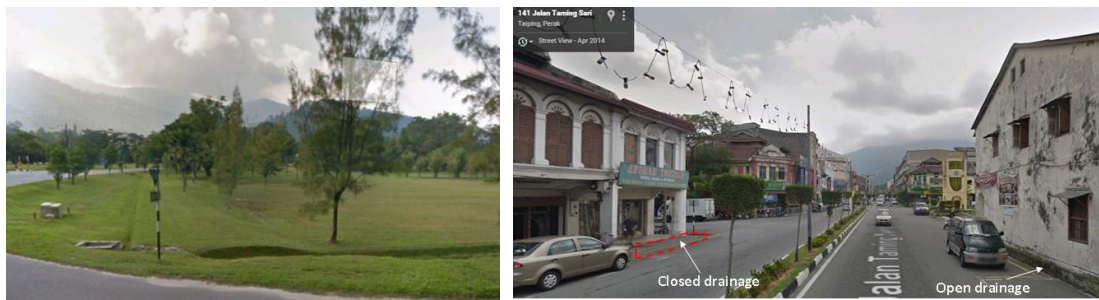


Figure 5.11: The existing grass swales drainage system at Taiping Lake Gardens (left) and storm water drainage at Jalan Taming Sari.(Source: Google map)



Figure 5.12: Schematic diagram of rainwaters discharged from Taiping town through Batu Tegoh river basin and Larut River (*Sungai Larut*). (Modified Google map: Taiping, Perak 2015).

The rapid water flows divert from Lake Garden into the monsoon drainages at central Taiping. Most of the storm water passes through Taiping Central Market and along the main streets before the rainwater discharge drainages. Therefore, some drainage at Taiping Central Market and the main street drainage (Kota Road and Taming Sari Road) are open for the heavy downpours. Moreover, the water runoff from Lake Pond flows into dhoby lines connected to the covered drains before discharge to the open canal at Masjid Road before ended to Larut River. Batu Tegoh river basin is the important water catchment areas for Taiping drainage system in diverting heavy stormwaters to Larut River and Kuala Sepetang area (WWF Malaysia, 2011) (Figure 5.12). Taiping drainage system erected to prevent flood and to control the heavy volume of rainwater direct from Larut Hill. However, there is also flash flood happen in present Taiping town as the problems of variable drainage size to

support the heavy stormwaters since Taiping town rebuilt in 1880. Unfortunately, such Ipoh and Kuala Lumpur mining cities have the flood problems, the most serious floods occurred in 1926 arouse to the canal reconstruction and flood retaining work (Ross, 2014).

The postcolonial drainage infrastructure intended for Taiping tin town systematically functions to reduce hazardous environmental problem. In Burian and Edwards (2002) studies, they elucidate the western designed drainage system in many ways such as pipe size calculation and slope ration combination. By observing at the drainage lines and street design, the analysis reveals the ditch system in Taiping was a pillar that constituted as the urban fabric and sanitation utilities. This is why British colonist had planned a healthy and well-being living atmosphere in Taiping. In sum, the century over drainage system in Taiping town needed to maintain as to preserve the important green infrastructure for rainwater controlled.

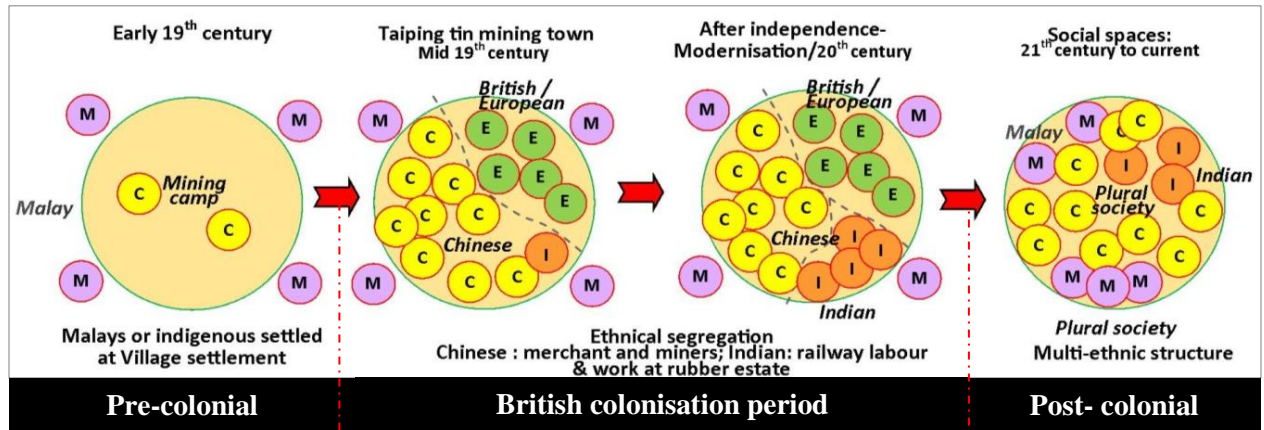
5.4 The social structure of Taiping mining town

5.4.1 Multi-ethnic composition constructed by tin industrialisation

Tin industrialisation has formed the industrial society since early 19^h century when tin ore found at Larut in Perak. Social activity associated with tin industrialisation stimulates a significance cultural identity to Taiping town. These native ethnics who are the Malay community settled at the vicinity villages (Kampong) nearby Taiping town. The socioeconomic status of local Malay depends on the agricultural farming and fishing (Teoh, 2004). When the first tin deposits found in Larut in the 1840s, Taiping became a melting pot of large Chinese immigrant moved to the mining camp. Apparently, the tin settlement was primarily resided by the Chinese ethnics. These Chinese societies are the merchants, shopkeepers and tin miners who are trading and working relations with the tin mining industry. The graphic model illustrated changing of social pattern in Taiping show in Figure 5.13.

Chinese labour or coolies who lived in Taiping at the early period are arrivals from Penang Strait Settlement. Moreover, later, the origin Chinese settlers immigrated from the southern part of China to Taiping during Larut tin rush period in the mid-19th century. Therefore, the Chinese settlement or explicitly as China town in Taiping town centre was occupied by the most discernable Chinese clans. Despite the fact that European elites and the British residency are the dominants of Taiping's urban dwelling with the possession of territories at the north-eastward of the tin town. As strengthens by Lefebvre (1976:31), the

“space has been shaped and moulded from a historical and natural feature whereas this has been a political process, also a product of ideologies” (cited in Evers and Korff, 2000:19). In which, the colony in Taiping tin town reveals their higher authority in political, economic power and the social hierarchy of the tin industrial society.



(Legend: M: Malay; C: Chinese; E: European/British; I: Indian)

Figure 5.13: Evolutionary social patterns of multi-ethnic formation in Taiping tin town.

(Author, 2015)

In the Taiping evolutionary development into a tin-mining centre, a 13 km length railway transport was suggested connecting to west seaport, Port Weld. Indian and Ceylonese immigrants workers were recruited to build the first railway lines connected Taiping tin-mining centre to Port Weld, which had completed in 1885s (Refer to Figure 5.6). Later, the agricultural expansions consequently tin ores depleted in late-19th century attracted widespread Indian labours working at rubber plantation, coachman, and the dhobi (wahermen). As mentioned by Khoo (1992), besides Indian, the Ceylonese Tamil and Sikh began occupied in Taiping; they hired as Indian police (Sepoy), institutional clerk, hospital assistant and land survey. Therefore, utmost Indian or Ceylonese settled at worker quarter located at Taiping centre or rubber estates. As the shown in Figure 5.14 resulted from Indian populaces in Taiping was 7,726 the second higher from the overall population (28,781 people) in 1931. Chinese is the majority (17,491) uphold as the highest population in Taiping by 1931 contrasted to Malay population is the lowest (3,564) before independent. Herein, tin mining industry has influenced the mono-ethnic society gradually transform into a plural society.

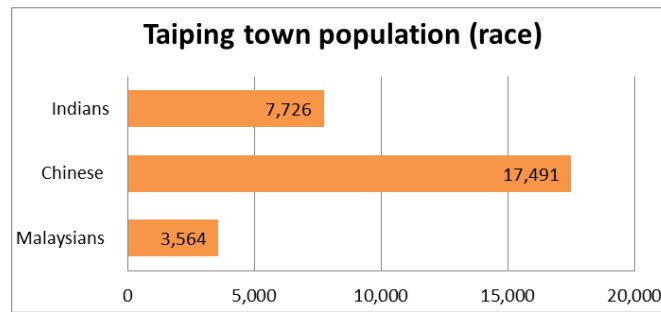


Figure 5.14: Taiping town by race distribution in 1931 (Source: C.A Vlieand, British Malaya: A report on 1931 census; taken from Lee and Lee, 1978)

The trend of industrial society occupied in Taiping tin town proven by the ethnical diversity data (Table 5.1) documented in Evers and Korff (2000). In the early year of 1833 and 1835, no ethnic composition reveal in Taiping as the tin deposit has found after the 1840s. Taiping population extremely grew from 4,000 (1872 to 1873) to 33,000 people after in the year 1874 and hitherto 26,000 are the Chinese settlers (Teoh, 2004). During the tin rush period by 1890s, Taiping populaces predominated by the Chinese tin labour a relative to other ethnics. The result of the plural society growth in Taiping from 1901 to 1970 exposed on slightly increased in comparisons to Melaka and Georgetown whereas the ethnic diversity showed declining (Table 5.1). Whereas, Kuala Lumpur indicated a steady growth of ethnic diversity in 59 years rose from 1911s. Yaakob et al. (2012) raised that urbanisation in Malaysia was increased from 1911 to 1970 (10 percent to 28.4 percent) due to the urban growth and ethnic composition in the small town. As aforementioned, the impact of socioeconomic position on tin industrialisation and variances ethical culture and religion presented the social structure of Taiping.

Table 5.1: Taiping's ethnic diversity in between 1833 to 1970

Historic period of Malaysia	Year	Taiping	Melaka	Georgetown	Kuala Lumpur	Notes: 0.00 result indicates no diversity, i.e., a population consisting of one ethnic group only.
British establish on Penang and Melaka	1833/1835	0.00	(0.74)	(0.70)	0.00	
British colonial period in Malay States (1874-1956) :economic growth of tin and rubber	1891	0.00	0.00	0.00	0.43	
	1901	0.55	0.00	0.00	0.45	
	1911	0.56	0.56	0.52	0.51	
	1921	0.57	0.52	0.50	0.56	
	1931	0.58	0.50	0.50	0.56	
The Malayan Emergency – communist revolutions (1947-1960)	1947	0.50	0.42	0.44	0.54	
Independent	1957	0.57	0.40	0.44	0.56	
Malaysia development	1970	0.58	0.41	0.45	0.60	

Source: Ethnic diversity of Taiping and other cities in Peninsular Malaysia (Source: modified from Evers and Korff, 2000:60)

The socio-cultural scenario implies British colonial imperialism and greatest extension of economic and politic that shaped a plural society in a mining town and the other Malay States. The emergence of a multi-ethnic or plural society in mining town essentially built a significance cultural character to the mining landscape. Abdullah (2011) mentioned that socio-economic factor enacted profound changes to the cultural landscape characteristics. In this essence, Taiping racial groups had contributed to local and Perak State socio-economic development and historic-rooted of the cultural entity. Hence, multi-cultural values become one of the important elements to explain a mining town character whereby industrial society formed through the process of tin revolutions. As Stuart (2012) defines industrial landscape notable as the man changed the natural landscape through industry process. Taiping industrial landscape and mining town unveils the characteristics of “associative cultural landscape” manifestation the interaction of ethnicity, religious, historical, cultural relatives to the natural landscape.

In contrast, Taiping town planning revealed the settlement segregation is based on British colonial urban zonings. For the third culture phenomena to incorporate settlers and European cultural (King, 1976 and Lai, 2010) and the ‘dualistic structural’ erected from economic, settlement, land use, and architectural segregations had imposed to the urban colonial landscape (Yeoh, 1996). The hidden and another fact of spatial or settlement segregation instigated to control economic activities and livelihood of each ethnic group. The tin mining town urban structure divulged a clear colonialism idea on resilience, spatial planning (space making) and social hierarchy. Evidently, British colonial’s power had erected the social transformation and plural spatial structure onto Taiping’s mining town. Nevertheless, the positive or negative social impacts of multi-ethnic society compositions are close associated to the urban planning and colonial political legitimate feature onto the post-colonial tin town. Wherein, Castells disputes “a city or urban is the social meaning assigned to particular spatial form by the historical fact that defined society” (Castells 1983:302 in Evers and Korff, 2000:18). Through Castell’s testimonial, the socio-cultural meaning of Taiping industry society is generated from the historical evolutions of tin economic mainstays and subsequently interpreted as an essence pluralism landscape.

To sum up the social structure of Taiping, this former mining town underwent the process of urban modernity during the tin industrial period and concurrent with the plural society formation. In which, the tin industry activities impetus to new technology,

transportation networks, and the social infrastructure extension linked with the tin town, seaport and port cities (Georgetown and Singapore Strait settlements). Taiping not only operated as a tin mining town but it was a commercial centre to convey goods via railway networks and rubber plantation. The department statistics of Malaysia in 1977 states a gazetted town with 10,000 people considered as urban area (Yacob et al., 2012). Hence, Taiping is an urbanised small town developing through the successions of tin and rubber economics and the infrastructure modernity in between 19th and 20th centuries. At present, the resulting of Taiping is remaining as a heritage town and commercial core with supported by tertiary industries such as light manufacturing, services, hoteling and tourism. The heritage relics contained both westernise townscapes and cultural diversities from the multi-ethnics. Taiping's townscape features such as heritage building typologies (e.g.: Townhouse, Colonial building, religious house, clan association and so on), landscape feature, landuse pattern, and urban spatial pattern reflected the past sociocultural impacts since tin industrialisation.

5.4.2 Physical and social structure integrations: clans associations

The prosperous of tin mining industrialisation during British colonial period had created Taiping a unique and historic urban setting amalgamated with multi-racial society. In the interior of Taiping town, the tin settlement was a dwelling for the multi-racial settlers are from the South and West Asian rooted disparity cultural background. The influential group of Chinese (multi-clans group) followed by the minor cluster of Indian, Ceylonese, and Sikhs; while the Malay ethnic stayed adjacent to Taiping town. Aforesaid, each ethnic group that occupied in Taiping gave a strong nexus to their livelihoods or occupation to live in Taiping. Consequently, the growths of plural society explicitly have generated their distinctive spatial settlement and social spaces in Taiping.

During the colonial period, Taiping town apparently separated into three main zones consisted of the highland (Hill station), lowland (British quarter) and Chinese settlement (Figure 5.15). Woodville Harrison, a traveller visited Taiping in 1910s had described: "the road from the railway station, a quarter of a mile down which is the rest house, is the boundary between the native and the English part of town." He further defined "the north lies the English quarters.....on the south of Station Road is the Chinese town, with broader streets than the most Malayan cities" (cited in Teoh, 2004:30). Through the fact of discernible zoning in Taiping tin town, the segregation boundary demarcated by the wider road and the open green spaces broader such as the Park, esplanade and Barrack had divided the British quarter and Chinese part of town. This is what Hassan (2009) accentuates British had implemented the

‘divide and rule’ development strategy to governance the local people and political empowerment.

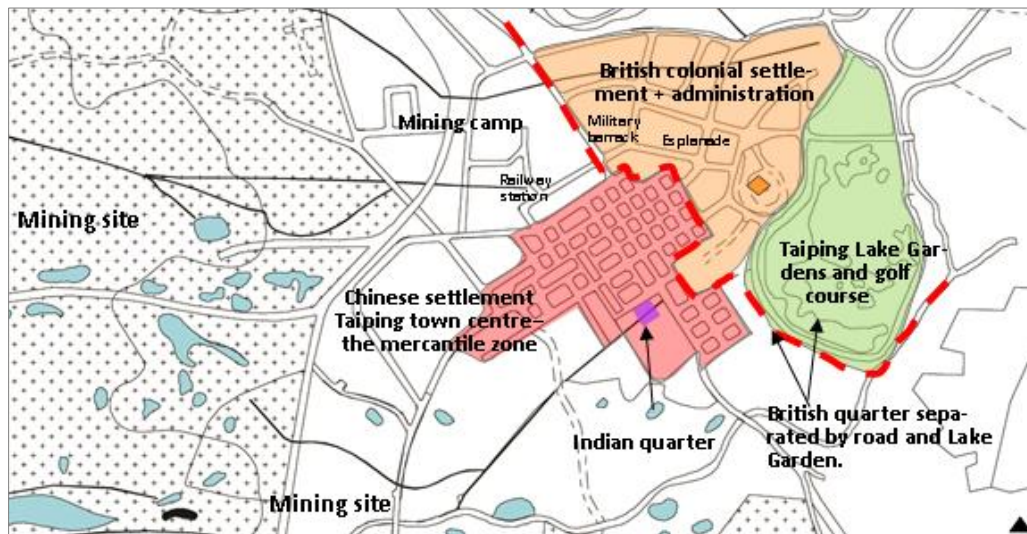


Figure 5.15: Taiping’s urban spatial patterns in early 19th century with three division zones by the highland (the hill station); lowland (British quarter, Esplanade, Parkland and administrative office); and commercial part of Chinese town.

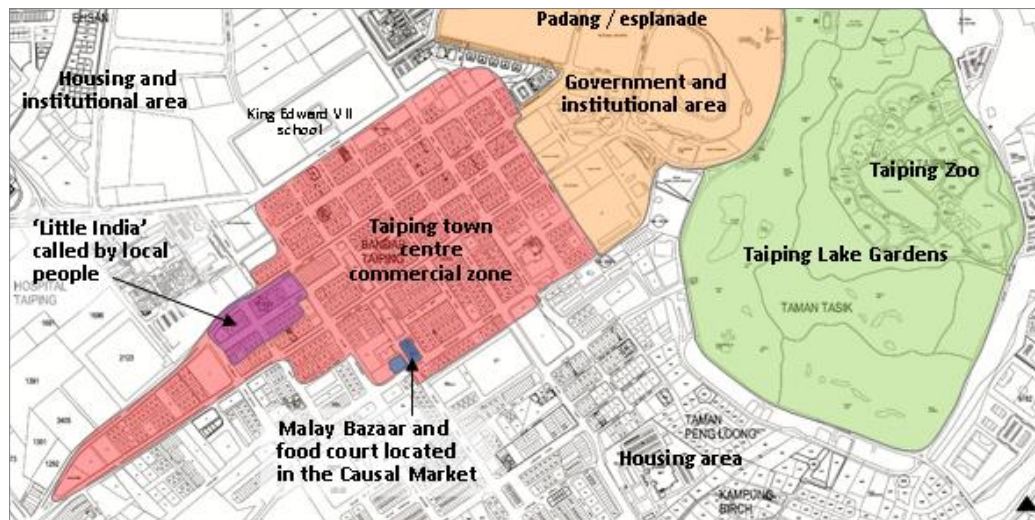


Figure 5.16: Multicultural social spaces in current Taiping heritage town.

At present Taiping, the plural society integrated from the physical inheritance spaces and historic townscapes from the early mining society. The urban pattern of Taiping town composites of the commercial centre, niche of ‘little India’ (located at Taming Sari Road and Market area), the casual market and Malay bazaar (food court and mercantile area) and the vibrant old market (refer to Figure 5.17). Every urban spatial or the social spaces fabricated by miscellaneous socio-cultural, economic activities, and local people everyday life. Accordance to Emeritus Professor Khoo Kay Kim, the entire Malaysia had the similar phenomena of

ethnic changed and plural ethnic composition. However, Taiping town has a distinct phenomenon of plural society formation that not relatively planned by the British colonial (Khoo, 1992). Despite the plural communities has shaped and expansion their living way and social activity in Taiping. For instance, since the past century, Taiping local people had nurtured their ethnic bond via the establishment of the ethnic associations, religious houses and the public commercial spaces such as marketplace and street.



Figure 5.17: The vibrant socio-economic and cultural activity at Taiping's Little India street located at Market Road and Taming Sari Road. (Author, 2014)

There are over a hundred year old clan houses or so called association found in Taiping built by the former wealthy tin merchant and the supportive society. Each inherited clan house or ethnic associations disclose to support his or her kinship, improving social cohesion, religious (patron deity), and occupation. Figure 5.18 shows the various clans and ethnic associations for the Chinese, Ceylonese, Indian, and Sikh communities. The complexities of each ethnic and cultural background inherited from the diversity Chinese dialect backgrounds (such as Cantonese, Hakka or Kheh, Hokkien, Hainan, Kwangsi and many more) for each Chinese clan who adhere in Taiping for their faith to toil as a tin labour or coolies. Besides Chinese, the early group of Sikh, Hindu and Pathan from India arrived Taiping congregation served as Perak Armed Police after Larut Wars (Teoh, 2004) and the Indian railroad labours were settled in Taiping. Through the mapping analysis, there are eighteen Chinese clans associations in Taiping instituted as early in 1887s during the tin industry period. The leading pioneer Chinese clans association such as Tseng Long (1887), Kwang Tung Association (1887), Shun Tuck (1896), Hin Aun (1899) were standing for the Chinese migrants who depended on welfare amenities by taking care for the guardians, poor, sick and eventually the funeral service. Also, the Ceylonese Association (1899), Indian (1906) and Punjabi Association or the Khalsa Diwan Malaya Association (1903) to improve social welfare among the ethnic groups. The Ceylonese Association was a hub for social, intellectual, religious and sport activities (Taiping Municipal Council, 2013:132).

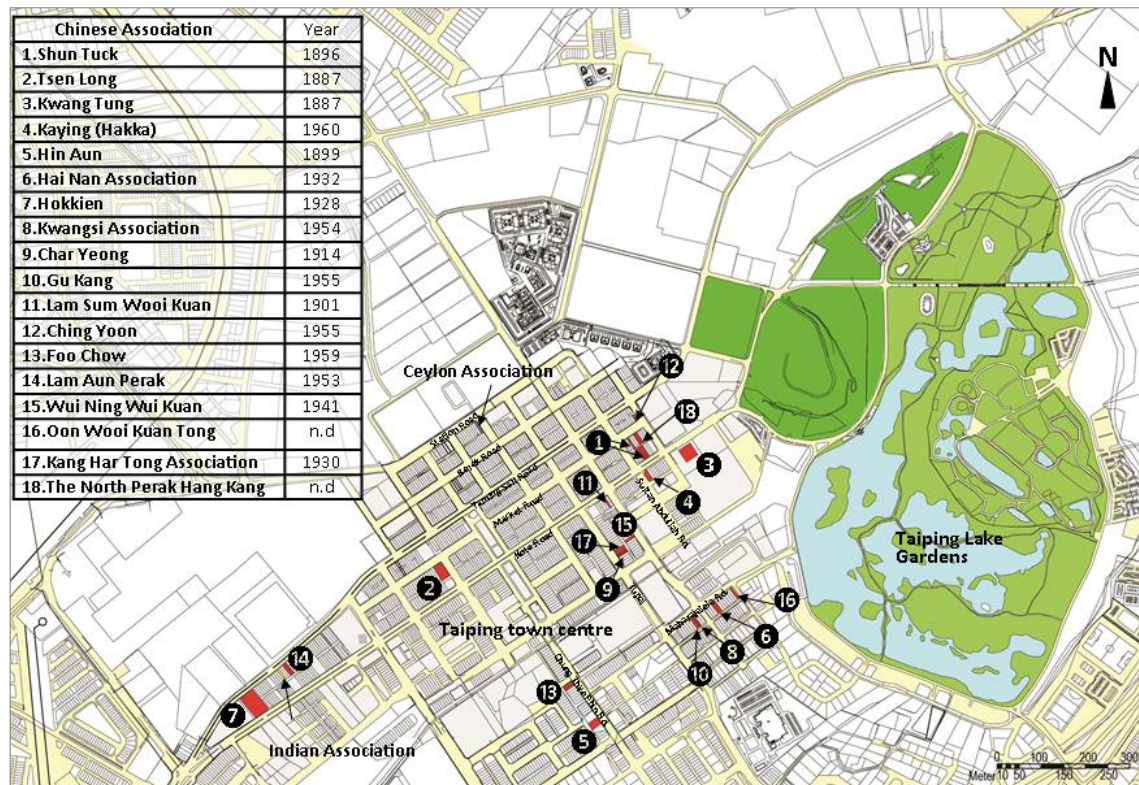


Figure 5.18: Allocation of the Chinese Associations, Indian Association and Ceylon Association in Taiping.

The current Chinese Association or Ceylonese Association in Taiping had gradually changed whereas the local society in charge of the committee members and operating the clan associations. Today Taiping clan association served the both social and religious function for celebration for the festive event, associated with educational scholarship and award, and the ancestor worship. Besides, the coexistence of socio-cultural networking created by the clan association, the physical legacy of association building had contributed to the historic townscape of Taiping ex-mining town. Instead the old shophouses, clan associations' evocative image and identity of Taiping's historic tin societies (Figure 5.19). Shuhana (2011) expounds the element that allied to the town's identity is most probably where the activity occurred at that place. Hence, the clan houses architectural are imparting as a significant cultural, nostalgic, memories, and activity nodes to assimilate people social spaces. In which, Lynch (1981) contends the familiarity of town's building stimulates the sense of place that is how people recognised to the place (in Shuhana, 2011). In all, the social space comprises the commercial street, little India, marketplace and bazaar and the clan association representative the virtual cultural diversities penetrates into Taiping's heritage tin town settings.



Figure 5.19: Kwangtung Association (left), Tseng Lung Association (middle) and Ceylonese Association in Taiping (right). (Source: Author, 2014 and <http://www.ceylonassociationtaiping.com>)

5.5 Taiping historic townscapes

The historic townscapes in Taiping are the combination of the western colonial townscape, Chinese old shophouses and multi-ethnic landscape. The townscape helps to create a locality sense of place whereby local people able to recognise the familiar townscape in Taiping ex-mining town. The form and spatial relation of a town explain via the historic townscape integration with people activities. Therefore, by assessing the building typology, street pattern, visual connectivity and legibility of Taiping town.

5.5.1 Typologies of heritage building: the old shophouses and colonial buildings

The typology of heritage buildings in Taiping prominent with the old shophouses for commercial and dwelling while the colonial buildings are function as government administrative, religious institutions, educational and club houses (Figure 5.20). Chun et. al., (2005) stated the Malaysia architectural evolutions shaped by the disparity cultural of native Malay, European, Chinese, Indian and another minority ethnic during the colonial period. In fact, the mix architecture design has modified and suit to local tropical climate. The traditional shophouses function as a residential where people lived on the upper floor (first floor of the building) and also for commercially used on the ground floor. All shophouses and old building in Taiping town centre are well laid out on the formal gridiron street pattern. The five-foot walkway or namely 'kaki lima' is the extension of 1.5 metres from the shophouses facade. The traditional verandah provided as a semi-public space for commerce, shopping, pedestrian movement, and also the typist service station at the corner of the sheltered walkway.

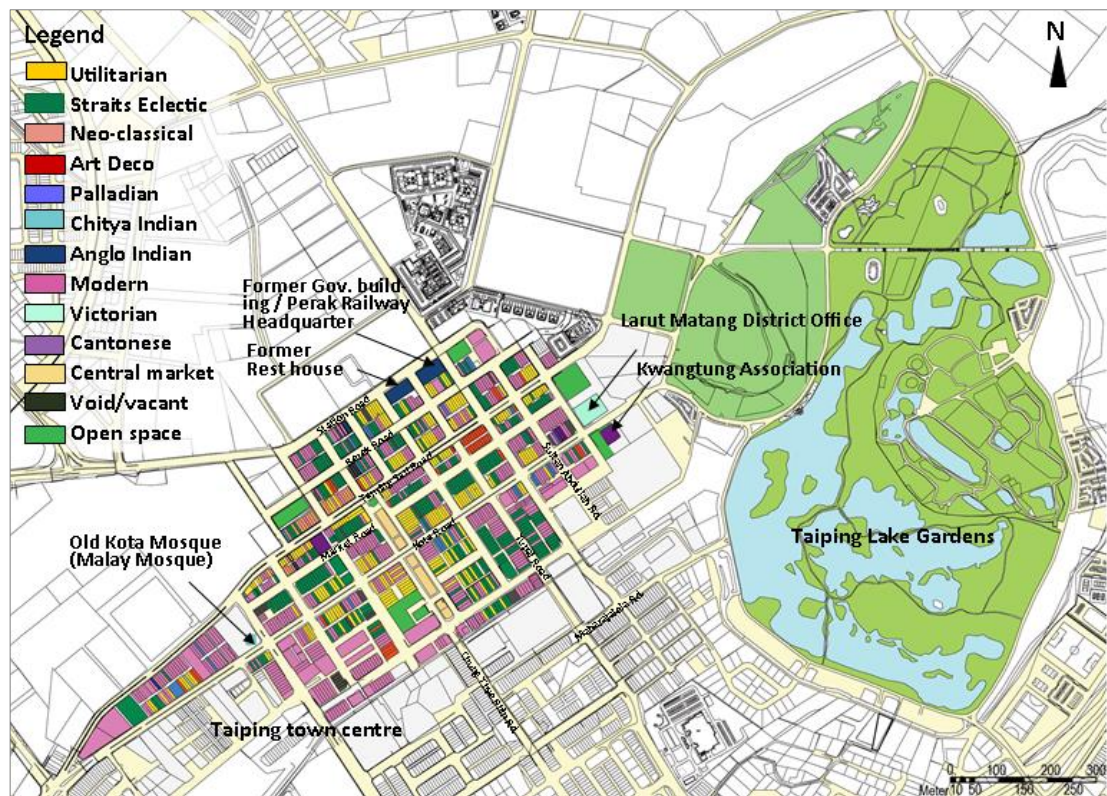


Figure 5.20: Typology of heritage building in Taiping town. (Source: Local Plan 2004-2015).

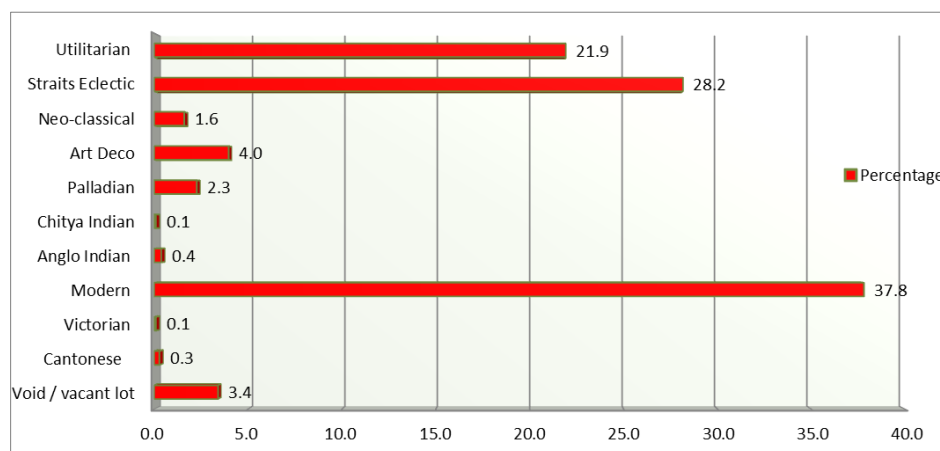


Figure 5.21: Distribution of Taiping building typologies in percentage (%).

Traditional shophouses are one of the dominant townscapes component in Taiping presented by the early style or utilitarian shophouses (232 unit/ 21.9%) and the Straits Eclectic (296 unit/28.2%) (Refer to Figure 5.20 and 5.21). The Utilitarian and Straits Eclectic shophouses constructed in early 1880 to 1930 showed the popular style in Taiping town. That means, the majority of old shophouses have built during the tin boom and rubber industry era in 19th to early 20th centuries. Taiping town was rapid growth in the 1880s after the town was rebuilt and later the extension of tin infrastructures. Therefore more over half of Taiping

townhouse have constructed in the Utilitarian and Straits Eclectic era architecture. These old shophouses were laid out on the main road (Taming Sari Road), Kota Road and located proximity to Central Market. The Straits Eclectic façade and are the mixtures of Chinese, Malay and European ornament decorative (Chun et al., 2005).

Whereas there are four hundred units Morden shophouses (37.8 %) was leading the highest percentage of architecture prototype in Taiping. With the Morden, architecture trends prevail before the pre-war period in the 1940s by interpreted a simple façade with new building materials. In between 1930 to 1940, the Art Deco (abstract geometric shape), Palladian (or Renaissance designs) and Neo-Classical architectural (complicated façade) styles brought into Taiping. The Palladian colonial building was the first Rest House and the headquarters of Railways located at Station Road where the former first railway station was located at the same area (Figure 5.22). Other heritage building typologies are the Chitya Indian (0.1%); Anglo Indian (0.4%); Victorian (0.1%); and Chinese Cantonese architecture (3.4%). Average building height of Taiping old shophouses building are two storey eight (78%) (Taiping Municipal Council, 2010). In contrast, there are vacant old shophouses were incompatible used for bird swift farms, storages and warehouses.



Figure 5.22: The Palladian architecture design adopted on the rest house (1894) (left) and Perak Railway Building (1885) (right) (Source: Taiping Detailed area plan, 2008-2020).

At the aforesaid discussion, the traditional building layouts arranged on the gridiron plot created a sense of continuity generated by the building facades, row of building blocks, and the urban fine grain that have improved the legibility of Taiping town. Consequently, these unique architectural buildings such likes the old market, District office, Chinese association and the various post-colonial and pre-war old shophouses created as the historic landmark buildings for Taiping heritage town. In addition to the historical Old Clock Tower (rebuilt in 1881s) function as a focal point and the significant landmark to remarkable the visual cues of central position in Taiping. The implications of heritage building typologies influence the delineating of Taiping town character through the building history, visual

aesthetic, increased pedestrian legibility and indicative the past memory of tin mining industry.

5.5.2 The visual characters and legibility of Taiping townscapes

The legibility of Taiping town was contingent on the activity nodes and the historical landmarks shaped by heritage building, monument, people activity or festive spaces, and townscape features. User familiarisation to a place can distinguish through a special attraction and townscape images that clarify as the imageability and identity by Lynch (1960), Relph (1976) and Shuhana (2011). The gridiron street allows people to move easily with the short distance building blocks. Each shophouses building block has divided into ten units shop lots (Figure 5.23). The grid-iron street pattern in Taiping connected by the main road and perpendicular to the cross street. Succinctly, the equal divisions of building block were separated by the eleven crossroads (horizontal alignments) and four main roads (vertical arrangement). Also, the accessibility linkages of Taiping's widen streets with the five-footways created a sense of continuity and the comfort walking environment for the pedestrian. The building blocks to design and the linkages with the street pattern in an urban space may increase the permeability and route choices. So, the relations of visual legibility and accessibility essential to alleviate people to recognise the spatial orientation in Taiping towns centre.

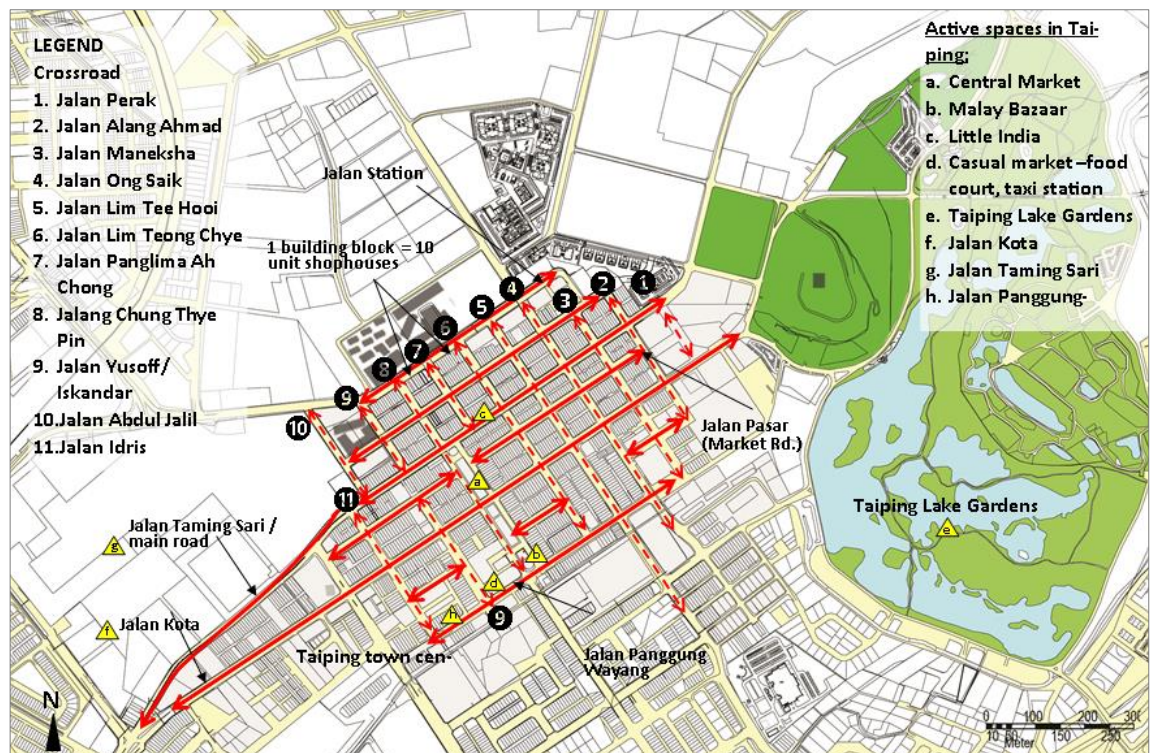


Figure 5.23: The accessibility of grid-iron streets pattern integrated with the active activity spaces in Taiping town centre.

Subsequently, the choices of a route in Taiping town are stimulated by the visual connections of historical buildings, or monuments and natural features in Taiping town. The image or a place character in Taiping emphasised by the types of commercial and active building frontage. For instance, the Goldsmith shops and pawn shops found at Pasar Road; while the furniture shops predominantly concentrated at Kota Road. Herein, the commerce activities enhance people to remember a place where the activity occurred. While, the scenic landscape of Larut Hill was a natural landmark to improve the legibility of Taiping town. Moreover, the most distinctive Taiping Lake Gardens and the century-old rain trees help people to intensify Taiping urban setting through the visual characters and people's memory. Through the interview with local people (n=30) about their memory about Taiping as an ex-mining town. The interview result reveals over 35% (20 respondents) had chosen Taiping Lake Garden as the most memorable place (Figure 5.21-left). Regards to the historical fact, local people remembered Taiping's tin mining history where the Lake Gardens built on the ex-mining site. As mentioned before, an activity of a place enables to strengthen visual connectivity to a location. Another finding thru interview exposes the recreational park is the highest activity place in Taiping (26%) demonstrated in Figure 5.24-(right). Though site observation, Taiping Lake Gardens was the most active space in Taiping town which is local people preference to spend their leisure time for physical excises, leisure, picnic, relaxation and boating on the lake.

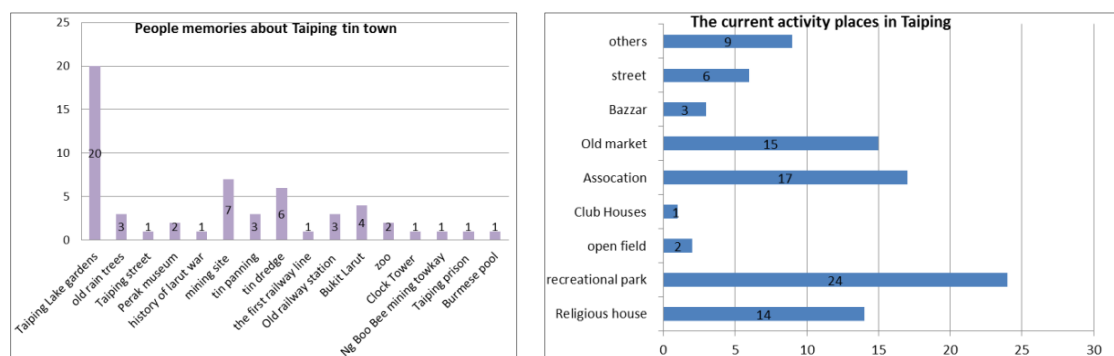


Figure 5.24 People memories about Taiping (left) and the activity place in Taiping (right) (Author, 2014).

Basri and Suhana (2008) emphasise the physical characteristic of a historic town such as street, facades, five-foot walkway and the unique townscape component enable to create a series vision, direct vistas, and a landmark or focal point for people movement. In short, the

visual characters and legibility in Taiping town unveil the advantage of the grid-iron street pattern, heritage building, activity nodes and historical townscape had increased people accessibility and visual legibility. The legible physical town settings and the historic townscape nurturing a sense of place in Taiping heritage town

5.6 Attributes and components of Taiping mining town

The layers composition of Taiping ex-tin mining town examined through the physical, social and cultural attributes generated from the historical past tin industry. Taiping's industrial landscape transformations have created a significant heritage identity that can be seen on the present cultural landscape and the valuable mining landscape attributes. The industrial landscape is related to the natural elements adapted by human via industrial process specified by Stuart (2012). These industrial heritage characteristics are inclusive the evidence of industrial site, industrial process, industrial fabrics, transportation and social activities (Pearson and McGowan, 2000 and Cossons, 2012). Nonetheless, industrial mining landscape succession in Taiping constitutes its history, physical landscape, socio-cultural affluence, and the interaction with the local lifestyles and livelihood.

The research findings verified the Taiping mining town attributes as: (i) the history factor of Larut and Taiping industrial heritage; (ii) tangible heritage covers the ex-mining sites that had converted into Lake Gardens; tin settlement, social infrastructure, heritage buildings, and hill station; (iii) intangible heritage embraces the western influence and multicultural society associated to worship, ethical association, eateries, and club houses for sport and recreational activities. The following discussion is amplification of each attributes based on the history, physical and social attributes;

5.6.1 Historic factor of the tin industrial heritage

The industrial heritage in Taiping tin town assessed by tin town location, historical facts, physical changes of tin town structure, and social connection to the tin mining town. Taiping's tin town evolution has transformed through the successive from alluvial plains to a mining camp and then developed into a new mining township in 1874s planned by British colonial. The physical landscape drastically transformed when the tin industrial infrastructure such as road and the first railway networks was build connecting Taiping tin town centre and Port Weld. Certainly, social infrastructures constructed to support high population settlers in

Taiping during the tin rush era. Taiping was distinguishing as the 33 of the 'many first' tin town accommodated by great built heritage and colonial landscape during the tin industrialisation period. Today, Taiping remains a strong character of the historic tin town, and a model of English planned city in Peninsula Malaysia.

5.6.2 Physical spatial pattern in Taiping tin mining town

The prototypes spatial pattern in Taiping was initiated by the western urban planning. The tin town was formed by the Gridiron Street, rectangular plot, open spaces, recreational area, heritage buildings and colonial townscapes. In Taiping town, the urban fine-grains shaped by the mass Chinese old shophouses and townhouses. Therefore, the physical spaces and settings in Taiping was permeable and accessible, decent space's orientation evoked by local activities. Besides, the historic public spaces such as Padang, marketplace, street, Taiping Lake Garden, hill station, and Dhobi Line (Public laundry site) are persisted for commercial, leisure and recreational area. Indeed, the spatial patterns in Taiping town provided a comfortable atmosphere which is the nature balance with urban lifestyle.

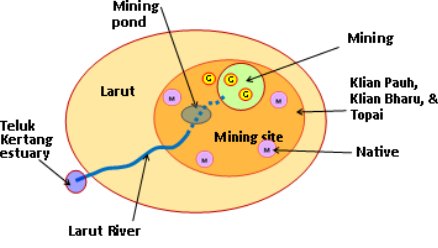
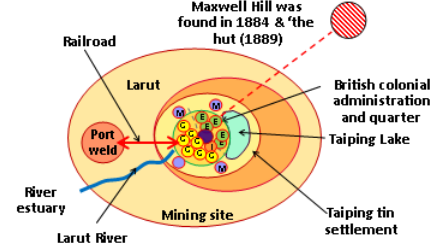
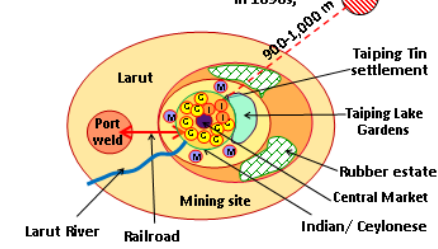
5.6.3 Socio-cultural structure of Taiping mining town

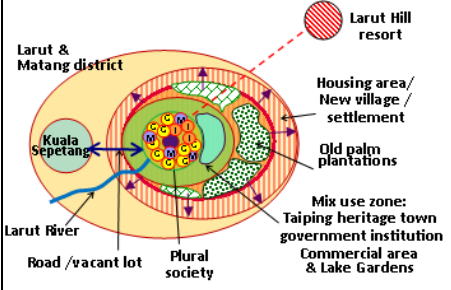
Apart from the British colonial influence on Taiping's town planning, the Chinese identities and multi-races cultural lifestyles had great influences to Taiping historic townscape. It had evidenced the mining society structured by the multi-ethnics from different cultural backgrounds. Additionally, Taiping's town centre settled by Indian, Ceylonese and minority races. Taiping townscapes constituted by the multiple social spaces such as the Malay bazaar, commercial town centre and Indian's shopping street. The ethnics associations and place of worships attempt to present the racial groups had taken place to shape the physical spatial pattern of Taiping mining town. For instance, the Chinese associations or clan houses constructed in the tin industrial period to support the welfare and hospitalise for the clan members who are tin workers or coolies. The multi-ethnic spaces in Taiping town had moulded in relating to their occupation and settlement. The old market is one of the Taiping melting pot gathered by different people. Therefore, the social and cultural influenced is related to the spatial formation in Taiping tin town. Besides, the imperative colonial landscape is historic public spaces that had designated by the British colonial such as Padang or Esplanade, Taiping Lake Gardens and street for daily usage.

5.7 Diagrammatic of Taiping urban morphological model

The following schematic diagram shows the urban transformation of Taiping town and the heritage mining town components illustrated in Table 5.2.

Table 5.2: Taiping urban morphology model

Diagrammatic model	Urban morphology	Physical spatial pattern	Socio-cultural
 <p>Early 19th century circa 1840: the Early mining period.</p>	<p>Informal Village settlement and mining camp located at the peripheral of the mining site.</p>	<ul style="list-style-type: none"> • Landscape: Larut plains-the mining site, river and also informal mining camps. • The riverine is the essential to transport tin ore from mining hinterland to reach the estuary. 	<ul style="list-style-type: none"> • Native Malay settlement and they are also involved in the small scale manual mining.
 <p>In the mid of 19th century: British colonisation period where Taiping town was established and Tin booms era.</p>	<p>Taiping was as the administration centre, tin mining settlement was built connected to the seaport-Port Weld.</p> <p>During the rapid development of tin industrialisation in Larut, the social infrastructural and transportation system fabricated in the tin rush era.</p>	<ul style="list-style-type: none"> • Sea port • Important public spaces of the mining settlement (the Chinese town); • central market, • Padang/ esplanade (public square) • Wide street • Lake Gardens (semi) 	<ul style="list-style-type: none"> • Chinese merchant occupied in the Taiping town centre whereas British and other European elite's settlement located at the north-east, the hill land in Taiping. • Chinese ethnics have their own entertainment such as Chinese theatre and later cinema and new club. • Chinese Clan associations, a place for socialisation.
	<p>Taiping tin town, the small township function as a main commercial centre for agricultural crops exportation to Port Weld though the tin deposit began exhausted and many Chinese miners moved to</p>	<ul style="list-style-type: none"> • Agricultural lands: the rubber estate plantations. 	<ul style="list-style-type: none"> • Indian who worked as a railway and rubber estate labour began occupied at the employee quarter in Taiping town. Besides, they are also Ceylonese or Indian who is

<p>Late 19th century: Tin-ore began depleted in Taiping</p>	<p>Kinta Valley.</p>		<p>proficiency in English language worked as government officer and consecutive chettier mercantile or loan shop.</p>
 <p>20th Urbanisation and rapid development as a commercial centre.</p>	<ul style="list-style-type: none"> • The New village located at the peripheral of Taiping town constructed during the Malayan emergency (or communist revolution). • The heritage mining settlement in Taiping was gazetted as the current heritage core zone. 	<ul style="list-style-type: none"> • Agricultural lands: oil palm plantations and rubber estates. • Ex-mining lands converted into housing estates: Kamunting (Klian Bharu), Simpang and Tupai. 	<ul style="list-style-type: none"> • Taiping town sustain because of the socio-economic activities such as eateries, services, and commercials. • Malay ethnic operates their business at Taiping town area though there are not livings in the town.

5.8 Conclusion remarks

This study reveals Taiping manifested the characters of colonial heritage town adopted British colonial urban planning and garden city town planning. Also, Taiping was a historical heritage tin mining town retains the rich history of Larut tin mines, tin industrial progression in the mid-19th century, social structure formation thru the tin industry society and the historic townscape. Subsequently, Taiping mining town and industrial landscape transformation evaluated by the land use mechanism on Larut mines, the urban morphology of Taiping town, social structure and multi-ethnic compositions. For the townscape analyses that included the drainage system, typologies of the heritage building, physical and social integration, ethnic association, visual character and legibility. The gist of the findings synthesised into the series illustrations of tin mining town schematic morphology model. Through the tin mining town transformation, the model is to elucidate the heritage significant attributes and element (such as: the Chinese town, British quarter, railroad, seaport and the tin settlement) that formed a heritage tin town.

Taiping tin mining town had tin trade connections with Penang port city as where to compromise on tin export, tin smelting, goods transfer, and the contract labour system to let the immigrant worker arrived at the same Strait port before recruited by the mining towkay. For the colonial urban planning, Hassan (2009) highlighted British port city and mining town possessed the mutual urban form that has adopted the grid-iron street design by the British administrator from a military background. As well as, the British officer is not the urban planner and land surveyor experts who are manageable to plan a large colony settlement (Ibid, 2009). Furthermore, Harun and Jalil (2012) disclose the urban characters for all the colonial towns in Malaysia having the likeness albeit the town situated in the different location. Hence, Taiping tin mining town has the similar colonial townscape, urban component and spatial distribution pattern of the port city.

Taiping mining town changed from the cycle's period through British colonial period, post-colonial era, after Malaysia independent up until the present. Taiping mining town and the industrial landscape changed over the time spans from the scattered mining camp or coolies house turned into a permanent township. On the other hand, some of the tin industry heritage relics especially the built heritages were threatened and abandoned. By the concern of heritage perspective, the Taiping heritage tin mining town should be hand in hand with the local community and municipal council on heritage conservation prospect. In which to protect the historic townscapes, scenic landscape and the historical profile of Taiping, which is the first planned tin town in Malaysia. The outstanding cultural landscape of Iwami Ginzan silver mine and also Cornish mining landscape shown the competencies in managing the inheritance historical landscape and heritage properties through the heritage regeneration and adaptively reused by way of industrial heritage tourism. Hereof, the extended of sustainable heritage conservation and management in heritage tin town conservation for the historic town character safeguarding and prolong the spirit of a place.

As a result, it is believed that placed the Malaysia National Heritage Act and led to the mining town and the industrial heritage properties for protections. It is essentials for Taiping to attain a sustainable cultural heritage in preserving the unique historic landscape, economic value, socio-cultural meaning and environmental asset in the future. Therefore, to keep Taiping retains as a lively ex-tin mining town, Taiping municipal council should reconsider the economic resources and the sustainability management plan to protect the values of existing tangible and intangible heritages and yet to improve the heritage conservation of a tin town. Nevertheless, the initiatives to identify, safeguard and promote the thirty-one Taiping 'Many First' or the primarily cultural heritage properties had listed in the Taiping's Many First

Report (Taiping Municipal Council, 2013). It is an initial attempt to approach Taiping to upkeep the historic mining town and to evoke local people awareness in heritage conservation.

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CHAPTER 6

CONCLUSION AND SUGGESTION

6.0 Summary the main findings

By relative to the findings and discussions from previous chapters, this is to conclude the study of evolutionary tin mining town and industrial landscape in Malaysia milieu specific to Taiping case study in Perak State. The tin mining town transformation evolved the chronological periods of pre-industrial era, British colonial period, and after independence phase. This research is also underpinning the identification of significant heritage characteristics and attributes that formed a tin mining town. By referring to previous studies and different theoretical reviews, the tin mining town studies are evaluated through the related conceptions of urban history, industrial heritage (industrial landscape), colonial urban planning and heritage townscape. It is importance to achieve the research aim and objectives on what, when, how and why the tin mining town shaped from one pre-industrial period until post-industrial landscape. By the synthesis of analysis results is interpretation into the justification of Taiping tin mining town heritage conversation and the protection recommendation.

6.1 The characteristics of tin mining town in Malaysia

6.1.1 The post-colonial heritage and plural society attributes contributed to the Malaysia mining town and industrial landscape formation

The urban evolution and the history of urban morphology began in the west coastal of Malaysia where all tin mining towns formed. British colonial first invasions were in Larut War via Pangkor Treaty Agreement in 1874s. Such historical event had opened up the tin industry

and rural hinterland development in Malay Peninsula especially at the tin lodes region (the Main Range and Eastern Range). There are four tin states found with rich tin deposits in Perak, Selangor, Negeri Sembilan and Pahang. In 1895, British colonial declared the four tin production states as the Federated Malay States (FMS), the Protected Malay States is to generate economic benefits for the colonist. The impression of the tin industry growths involved the mining methods, tin labour employment system, and the Chinese Kongsis (or company) and Western tin entrepreneurship. Kinta Valley tin mining district and Sungai Lembing underground ground mine were selected for precedent case because both tin mining towns is the main tin producers in the Malay States in the early 20th century.

Through the understanding of Malaysia tin mining town transformation from the ephemeral mining camp into a permanent mining township, the substantial evolution and factors had been identified this study. The findings concise the aspects of geography setting, the chronological historical of tin industry, British colonial influences on tin town planning and economic-politic regulated; and socio-cultural background. The geographical and historical setting demarcated the fertile, rich tin town was located on the tin belt at the Main range (Kledang and Bintang range) and East Coast ranges in Malay Peninsula. Secondly, Malaysia tin town or tin settlement had built based on British colonial town planning. Succinctly, the tin town was planned on the widen street (thoroughfares) laid on the grid iron street pattern. Moreover, the colonial town elements such as reserved open spaces for public use, parkland, commercial area, English landscape, Padang, social facilities (such as school, religious house and hospital) had constructed. Next, the tin industry society is generated from the multi-ethnic groups. They came from different cultural background, religious beliefs, and custom living in the mining town. The indication of planned mining town has created a heritage mining town and also industrial mining landscape in the west coast region of Malaysia. The former mining town manifested visible and robust historical townscape characters comparable to the rural cultural landscape at Eastern Malay Peninsula.

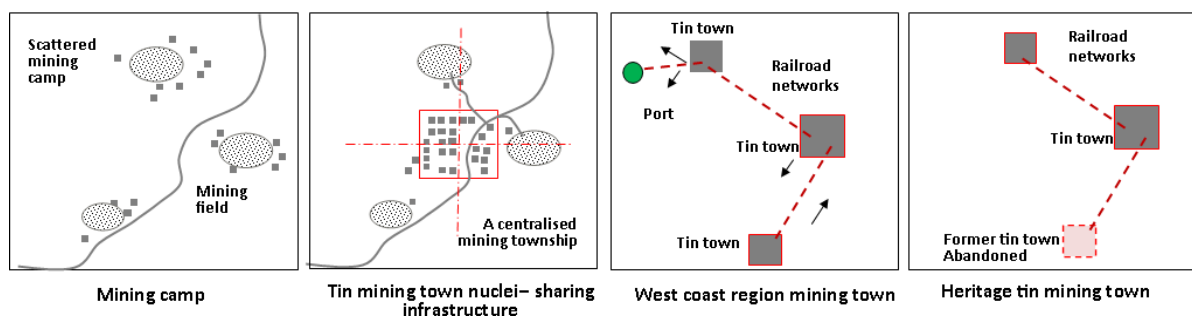


Figure 6.1: The schematic diagram of tin mining town transformation.

6.1.2 The typologies of tin mining town in Malaysia

The physical and social attributes mentioned in the Malaysia mining town character is essential to clarify the typologies of heritage tin mining town in Malaysia Peninsular. The validation the type of tin mining town division are accordance with the key divergences mining town characters consisted of the most productive mining town (Kinta Valley district), the Eastern Range of underground mining town (Sungai Lembing), and the ‘many firsts’ heritage mining town (Taiping). In concurrently, the natural features of tin industrial landscape includes the river (water transport), hill landscape and valley plains had modified through tin mining industry definite integral in cultural mining landscape meaning. By looking at the historical relic townscapes in Malaysia’s tin mining town, the industrial heritage properties are related to tin industrial infrastructure supplied for hydraulic pump mining technique and new technology mining machine. Each respectively found in Gopeng’s iron made water supplier giant pipelines for surface mining, Batu Gajah’s tin dredge (namely TT5) and the deepest underground mining shaft in Sungai Lembing. Hence, based on above stated historic townscape possession and tin mining town urban physical characters are pertaining to the typologies of Malaysia tin mining town listed as followings;

a) Tin town built in between river

The river functions as the industrial transport interpreted as a linear landscape in industrial landscape classification stated by Palmer and Neaverson (1998). Kinta River was a decisive tin industrial mainstay used as the water transportation in the early period of tin rush mining period in Kinta Valley. Additionally, Ipoh tin mining town agglomerated of the old town and the new part of the town built in between the Kinta River. The urban extensions of Ipoh new town are because of the overpopulation condition in existing old town. Ipoh tin mining settlement concentrated nearby Kinta River yet to fortify the distinctive river element of industrial townscape provision for both mining transportation and urban tin town character.

b) Tin mining town attached to a hill station

For the case of Taiping tin town located at the Larut Foothill to become another prototype of tin mining town which is intentionally built by British colonist. Herein, the two British settlements had constructed in the same mining town positioned in the mining town centre and another is on the highland. The hill station planning became a significant urban structure to a Taiping tin mining town. In which the main purpose, the colonially designated quarter with primacy regards to the comfort living of cool weather and to grasp the magnificent scenery from the hilltop landscapes. In opposition, the identification of hill station associated with a tin

town congruent with British colonial town planning on segregation with the settlers stated in King (1976); Yeoh (2006) and Hassan (2009). The hill station evident the equivalent as a retreat settlement or hill resort for the European elite or British colonial. Again, the social institutional and political-economic control have integrated hill station establishment in a hinterland industrial mining town.

c) The tin town British residency built on the higher ground

The mining town spatial pattern entailed of the British quarter area separated from the Chinese townhouse and shophouses, tin labour settlement and native villages. Generally, in Malaysia mining town, the British colonial dwelling and administration centre built on a higher ground or hillside. In which, the higher elevation that allocated British residency revealed the British had adopted the colonial town planning principal to enforce the colonialism or political power to conceal the social disparity hierarchy of a mining town. In truth, Taiping, Ipoh, Batu Gajah, and Sungai Lembing have exposed the clear tin settlement where the British or tin manager houses established on a higher ground level. Indeed, the purpose of the land use planning in a mining town is to upkeep the sense of surveillance and colonial administration or cantonment control.

d) The development of tin mining town centre disparity to typical mining town

Not all the tin mining town in Malaysia planned as comprehensiveness as the tin mining centre such as Taiping, Ipoh, Batu Gajah and Sungai Lembing. Ordinarily, British resident or the tin mining company built a mining settlement and the social infrastructure to shore up the tin industry and also the industrial society. As the reason, for only tin mining town centre or British administration centre possessed the inclusiveness tin town infrastructure and the town structure are much more complex and compactness comparable to other small-scale tin mining town. The British colonial planning complemented entertainment and leisure facilities closed to British residential and administration zone. Such westernise social facilities (likes club house, cricket field, recreational park, and golf course) fabrication in a mining town pervaded European or colony atmosphere in a tin town. In contrast, such as Tronoh, Papan and Pusing tin mining towns erected with the primary road structure, railroad branches with other tin mining town, the old shophouses as the commercial and social services niche.

In sum, the implications of basic tin mining town planning in Malaysia have the analogous characteristic of same urban fabric (Chinese town, social and entertainment amenities). Wherein, the tin industrial infrastructure constructed is to improve the tin industry transportation and communications network from the inland tin township to the seaport. It is

not surprising that a smaller tin mining town was less developed compared to the higher populated tin settlement that functioned as the British administration centre and a commercial midpoint in connecting the adjacent mining towns. In certain cases, such tin industry infrastructure seen in Batu Gajah shared the town's facilities with the closed proximity Pusing tin town in Kinta Valley district.

6.2 The unique heritage of Taiping historic tin mining town

In chapter four and five, the in-depth case study and analyses on Taiping validated the oldest tin mining town characters erected by British ruler. The mechanism of Taiping mining town is undergoing succession transformation from the natural valley landscape developed into mining camp during Malay Chieftain led Klian Pauh mines. Taiping Township constructed when British first intervention into Perak State because after the chaotic Larut Tin war triggered among Chinese secret societies and Malay Chieftains. After ended the Larut Wars, Taiping gazetted as a new township setup with clear physical town's boundary. The first railway lines connected Taiping and Port Weld has operated in 1885s for tin export to Penang port city for tin smelting. Taiping rapidly rebuilt in circa the 1880s after caught fire. The Chinese town constructed laid on the formal grid-iron street in the town centre separated from British inhabitant and administration area. Taiping Township zones constituted highland (hill station), lowland (British administration and Parkland), and the Chinese town.

Simultaneously, Taiping becomes an important tin centre and the largest town in Perak before Ipoh selected as the capital of Perak state. Tin rush in Taiping had constructed multiple social infrastructures and facilities to support Larut tin industry. At present, there are thirty-three of 'many first' including the first railroad, colonial administrative building, Taiping Lake Gardens (the first public recreational area in Malaysia), esplanade, market, gaol, seaport and so on. Taiping urban history was notable when the Eastern Asian Chinese diaspora of extensive Chinese labours (or 'coolies') and traders immigrant into the British Malaya from the Strait Settlement into the northern Perak and subsequently disperse to other tin states. The initial tin worker employment recruited through the credit ticket-system controlled by the secret society (the mine worker in debt to many expenses such as gambling and opium). Later, the tin labour employment had replaced by the truck system where the coolies lived at the Kongsee (Kongsi) house supported by food, dormitory and other necessity goods. Therefore, the Chinese are the dominance population in Taiping mining town. Through the historical

record, there are criminal issues where workers escaped from tribulation coolies' life and also the squatter problem.

At present, the post-colonial landscapes and heritage in Taiping are not much changing after Malaysia independence in 1957. After World War II (1945), due to communist intricacies latter, the British colonist declared the Malayan Emergency period from 1947-1960. During the Malayan Emergency period, the new villages (to segregate people from communist) were built at the adjacent Taiping town. Till today, this tin mining town has never deserted like other tin towns that had turned into ghost mining town. Taiping has provided a sustainable and well-being living environment to the local. Through tin town planning standpoint, British colonists have created a successful distinct model of tin mining settlement during the tin industrialisation era in Malaysia. Likewise, the physical planning of Taiping town is conveying the legible accessibility, the efficient drainage system for flood prevention, green lush public garden, and the many first heritage legacies.

The inheritance historical spaces exposed local people in Taiping had been utilised the public open spaces since the olden day as far as like the European to spend their leisure time playing soccer at Padang or esplanade, club house, hill station, and the Lake Garden. In the nutshell, Taiping is a unique heritage tin town in term of the well-town organised with the great landuse pattern of greenery Lake Gardens assimilated to the downtown built area. Undeniably, the garden ponds functioned as the water catchment to discharge rainfalls from Taiping downtown and delivered through Larut River ultimately to Kuala Sepetang. In comparison to Kinta Valley and Sungai Lembing tin mining towns, Taiping has the efficient railroad transportation connecting the westward coastal seaport. Taiping tin mining industry compatible to show the secondary resources of Matang mangrove forest had supplied the fire-woods for driving the steam locomotive. Therefore, by the understanding of mining landscape conception to delineate the natural resources modification is mainly to support tin industry. That is why Taiping's economic status was persistence after tin ores depleted in early 1900s as the Taiping performed as a commercial centre and transportation hub for rubber export.

Multicultural ethnic formation in small tin town is another significant attribute to show the influential ethical landscape from the Taiping's urban morphology and spatial patterns in the tin industry progression phases. The segregation policy of 'rule and divide' in colonial cities was different and commonly divided into the classes (Hassan, 2009). Such colonial apartheid system in South Africa has forced the native (black people) to live apart from the 'white' colonist. By some means, Taiping tin town emerged the separation dwelling

zoning in between British colonist and settlers. The research findings indicated the invisible boundaries was making up for the wide street (or thoroughfares) and the lake garden's boundaries. In the interim, the plural society in Taiping shaped by the Chinese, Ceylonese, Indian and other minority ethnics. The tin industry societies in Taiping divulge a pluralism character was a significant heritage attribute to imbue the urban structure of a mining town in Malaysia context. Various social spaces generated through the ethnic place-attachment with their dwellings, workplace and social spaces. For instance, the Indian lived at the quarter near to the Dhobi lines while the Chinese-run business resided at either same shophouses or townhouse. The spatial pattern of Taiping town associated to people socio-cultural activity. The ethnic associations (Chinese clan association, Ceylonese Association and Indian Association) and worship building (Chinese temple, Hindu temple, church and Malay mosque) are the tangible heritage to present diverse ethnical cultures and their way of life to build up the pluralistic tin industrial society.

The historical townscape finding in Taiping denotes the typologies of the heritage buildings, the gridiron street pattern, heritage component, natural features. The historic townscapes interpretation in Taiping combining of the western and eastern cultural elements portraying by the old vernacular shophouses, civic building, religious building and the heritage sculptures. This study examines the historic townscape in Taiping emphasised though the Taiping Lake Garden and Larut Hill created a landscape vista and natural landmark to certify the settings of Taiping town via the greenery landscapes. As well as, local people memories reflected the image of Taiping Lake Gardens in related to the reclaimed ex-mining land and hundred-year-old heritage rain trees. The importance of visual cues in Taiping heritage town specify by the heritage sculptures of Ng Boon Bee's donated water fountain and the Silver Jubilee and Memorial Jetty placed at Taiping Lake Gardens. The gridiron street layout in Taiping is to ease people movement in between the short distances building blocks. In Taiping Township, for each building block in the old town centre have allocated ten units of shophouses. Indeed, the sense of continuity amid the linkages of widens streets with the five-footways ('kaki lima') shaped a pedestrian friendly and comfort environment for users. Other than historical buildings and natural features of Taiping town, the building activities enable to improve visual legibility. In which, the variances active frontage and business of old shophouses signify the place's location. For instance, the marketplace and bazaar mercantile activities concentrated at Pasar Road. In other words, the historic townscape in Taiping had the utmost visual connection not only thru the historical elements but also where the human activity occurred in certain spaces. In brief, the visual legibility and accessibility in Taiping town are attached by the unique townscape, natural feature and the influence of activity nodes.

In short, there are the British's colonial town planning and local landscape congregation into the physical structure of Taiping heritage tin town. The evolutionary process indicated the transformation of industrial landscape in Taiping tin town. Through the tin town extension, the physical heritage and the intangible social-cultural aspect essentially influences the spatial pattern of Taiping town. Especially, the typologies of the heritage building, religious house, association and commercial spaces (Chinese mercantile, little Indian Street and Malay bazaar) manifested the inimitable historic townscape to Taiping. All the heritage features engendered during the tin industrial period. The tangible, intangible heritage, local people's perception and the precedent history created the principle attributes and significance heritage values to Taiping tin mining town.

In all, this research is to validate the Malaysia mining town characteristics and the valuable heritage properties that are necessary for heritage conservation. The heritage tin industry in Malaysia has once achieved the largest tin exporter in the world-historic economic in the early 20th century. So that, it is crucial to preserve the remnant and the legacies of the tin mining industry whereas tin town portrays a historical identity, heritage values and culturally rooted from the plural tin society. Perhaps in future, there might have another urban transformation in bringing new impact to the heritage ex-tin mining town; therefore, the heritage conservation approaches essential to maintain the physical and social heritage alterations over the time. Hence, through the research finding and the suggestion stated in next discussion is to advocate Malaysia tin mining town under safeguarding.

6.2.1 Discussion on the Taiping tin town characters for heritage conservation

The land use and urban transformation of a mining town had changed the physical environment and social landscape such as in Taiping town. Hence, the notion of industrial heritage, mining landscape and historic townscape studies ensues on the following justification for Taiping in the interpretative potential cultural heritage conservation approach. Besides, the heritage character of Taiping tin town was justified by denoting to National Heritage Act (2005) as discussed in chapter two wherein the importance to preserve the history and cultural significant allied with the unique tangible and intangible heritage aspects.

6.2.1.1 Modification of heritage core zone boundary

The tin mining town pattern and industrial landscape development validated thru the mining land use evolution, the urban morphology of mining town, and the tin town settlement zoning. The reason to modify the heritage conservation boundary primarily with regards to the importance heritage tin settlement constituted of British quarter and administrative zone; Chinese part of Taiping town (commercial zone), and the green lowland area (Taiping Lake Garden) not included in current main heritage boundary. However, the core heritage boundary indicated in Taiping Heritage Town Special Area Plan (Taiping Municipal Council, 2010) is excluded Klian Pauh area which is the early mining field in Larut and the major ex-mining land had converted for building uses like Taiping's Museum, Taiping Gaol and the government offices.

The proposed modification of core heritage zone boundary comprises the heritage site and buildings such as;

The proposed modification of core heritage zone boundary comprises the heritage site and buildings such as;

- i. Klian Pauh mining site is necessary to reveal the early mines in Larut operated by local Malay chieftain, Ngah Ibrahim. The first group of Chinese miner from Penang Strait Settlement under Hai-san group (or the secret society) to assist Ngah Ibrahim to work at Klian Pauh mining site.
- ii. Malay States Guides Barrack (1873) which had replaced by the Royal Ranger Regiment (RRD) or the cantonment for the military.
- iii. All St. Church (1883) was the oldest and most esteem timber constructed Anglican Church in the Malay Peninsula. All St. Church is sandwiched between the church cemetery, a personage and a school.
- iv. Treacher Methodist School (1889) is one of the earliest English girl school introduced by British colonial during the tin industry period in Taiping.
- v. Ling Nam Temple and Cemetery (1848) was the oldest Chinese temple of Tam Kong goddess (Taoism) built accordance with all indispensable elements thoroughly situated adjacent to water; half up a hill at Klian Pauh, rich in the gold

plate covered decorative carvings and murals (imported from mainland China) with dragon features. Ling Nam temple was once a thriving religious and political centre of the Hakka clans with the reminiscence of the tin mining heydeys in 1886. The oldest cemetery in Taiping is situated behind of Ling Nam temple was to indicate the early mining camp and settlement had constructed in Larut before Taiping township built by British.

- vi. The heritage building of Taiping Museum or Perak Museum (1883) is protected by Taping Municipal Council but is not inclusion in the core heritage conservation boundary. The Perak Museum is the oldest museum in Peninsula Malaysia.

Suggestion;

The character of heritage tin mining town should embrace the social facilities that built during the industry period comprises the religious building (Chinese temple and Church) and government buildings (barrack, Museum and Treacher Methodist School) are not locating in the heritage conservation zone proposed by Taiping Local Municipal Council. Therefore, the suggested extension boundary of current heritage zone is to protect and reinforce the historical land use and significant cultural properties related to Taiping heritage tin mining town (refer to Figure 6.2 to Figure 6.4).

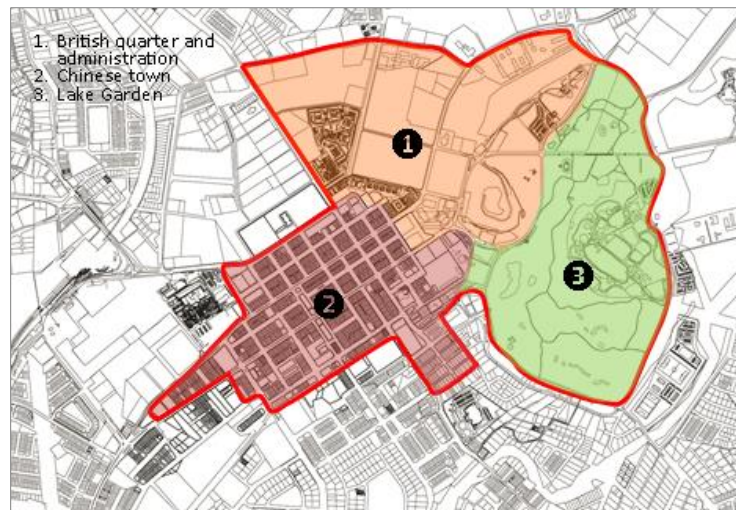


Figure 6.2: Tin mining settlement during British colonial period since 1880s.

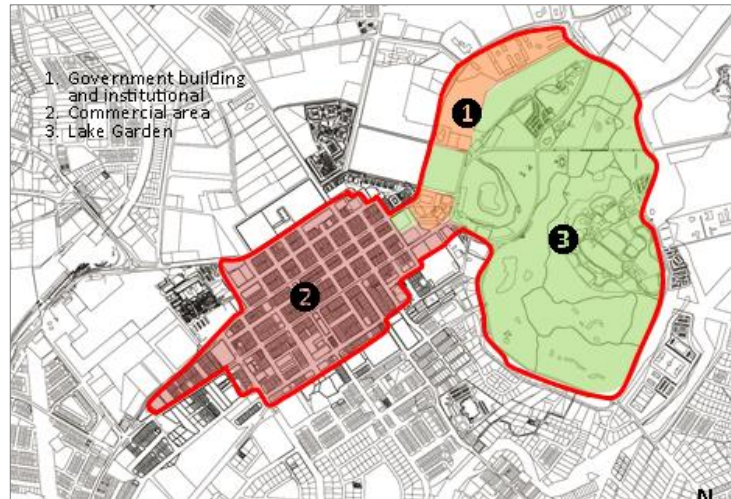


Figure 6.3: Taiping heritage core zone proposed by Taiping Municipal Council.

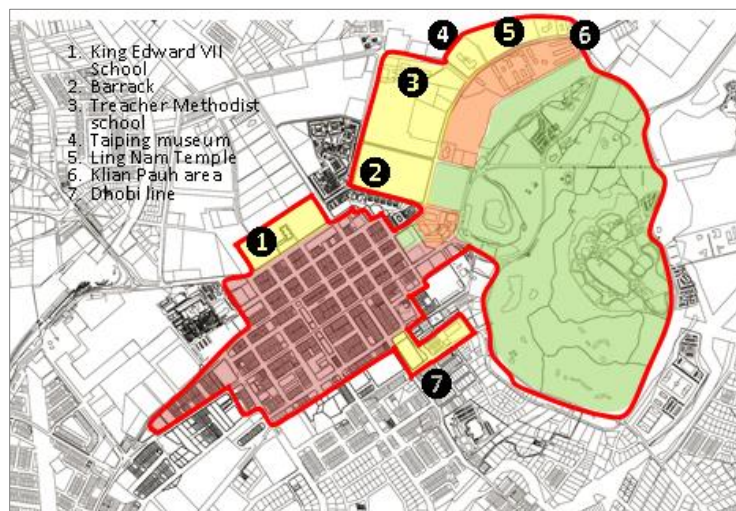


Figure 6.4: Proposed the modification of Taiping heritage core zone.

6.2.1.2 Regional mining landscape conservation

Taiping tin town attached to the English hill station in Bukit Larut (or Maxwell Hill) revealed as one of the typology mining towns in Malaysia. However, the historic colonial settlement is not gazetted in the historic regional conservation. Accordance with the post-colonial town planning, there is dual British (or the European) settlements built in an ex-mining town. At the meantime, the hill station and British quarter unveiled the elite status of colonial inhabitant segregation in the post-colonial town planning. By referring to the current heritage conservation planning in Taiping, the preservation of the Larut Hill is focused on the

eco-tourism which is inadequate to protect the regional industrial mining landscape (refer to Figure 6.5).

Suggestion;

- i. To conserve the heritage ‘cottage houses’ and the natural landscape of surrounding Larut Hill due to the tin industrial historical importance and colonial heritage to Taiping Heritage Township.
- ii. To preserve the visual landscape of Larut Hill remarkable as the green lush landscape backdrop to Taiping ex-mining town.

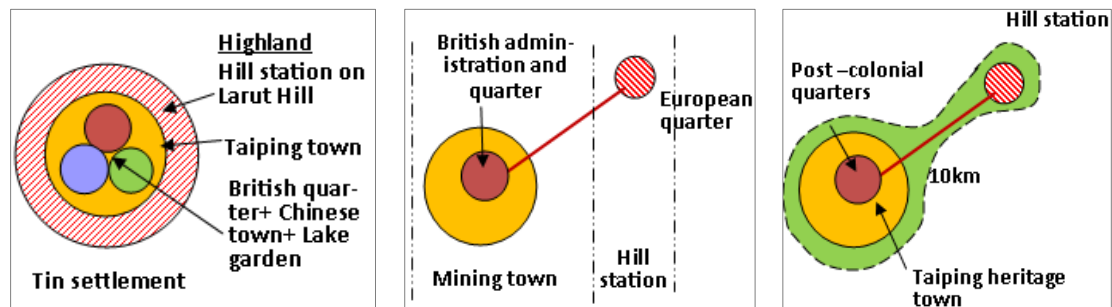


Figure 6.5: The heritage hill station indicated as a significant landscape attribute to the Taiping tin mining town.

- iii. Likewise, the regional mining landscape preservation might cover the prominence existing seaport and ancillary industry (such as foundries, metal work, or other secondary economic support). For example, the mangrove forest (conservation management), charcoal factory and the fishermen village (former seaport) at Kuala Sepetang manifested as the secondary commercial industry during the tin industrial transformation period.

6.2.1.3 Railway track as the linear industrial landscape conservation

The railway system was identified by Palmer and Neaverson (1998) as the linear landscape in conjunction with the heritage industrial expansion. The rail infrastructure is the important industrial townscape hereditary from the tin industrialisation in Malaysia and subsequently, the rest of railroad network was built in difference phrase mainly for the tin transportation via a seaport. The first railway track built in Larut area served the tin transportation from hinterland mining town to Penang for tin smelting though Taiping and Port Weld railway. However, the railroad in Taiping-Port Weld had dismantled in the 1980s and subsequently turned into road and houses. At present, the reserved railway tracks are

classified as the vacant lots by Local Municipal Council. Therefore, the regeneration of old railway tracks for the tin industry heritage prospect.

Suggestion;

- i. The revitalisation of existing Taiping-Port Weld railroad designated into several functions such as the landscape corridor (close to the residential area), 'historical memory lane' for 131 years of Malaya first railway track and green area for water catchment.
- ii. To revitalise the old railway station (located at Station Road) as the railway museum such as display the old locomotive (rail technology) and the historical fact of railways development in an early tin mining town.

6.2.1.4 Historical social space in Taiping ex-mining town

The historical, social spaces in Taiping were developed concurrently with the thriving of tin industrial the historical, social spaces in Taiping were developed concurrently with the thriving of tin industrial in early 1860s to 1900s. The social space is underpinning mining industrial community interaction. At present, Taiping local authority had proposed the new festive 'art street (Station Road), fruit street (Market Road), and night market (Berek Road for the commercial and tourism attraction. Even, the heritage trail promoted by Taiping Municipal Council is focused on the physical heritage buildings. Henceforth, the inheritance social-spatial structure of a heritage mining town such likes Taiping collective of socio-cultural activities and people way of life to manifest the diversity of plural society and a sense of place.

- i. Dhobi line (1898) (began in 1879 in the form of Dhobi shed at the stream of flowing water beside Museum).
- ii. Respective Clan Association was a social institution that represents the clan, kinship, dialect, home village from origin country, territory, or occupation basis.
- iii. Taiping's Little India is a communal space generated by Indian community to conduct their religious, retail shop and boutique (commercial), traditional festival and eateries.

Suggestions

- i. Besides to conserve the heritage buildings that related to the urban history of ex-tin mining town, the preserving of social spaces cum the social history contributed in structuring the social-cultural to a tin mining town. Therefore, the adopted the social spaces into the ‘heritage mining town’ heritage trail networks to evoke visitor understanding and to reminiscent the diversity social and cultural experiences at the dhobi line, clan association and Taiping’s Little India.
- iii. Besides social spaces conservation, the local oral social history related to a mining town shared by the elderly about their living history, significant cultural event, and the social activity associated with tin industrialisation. Hence, it is essential to collect and record the oral source from local people for in-depth indulgent of an ex-tin town socio-cultural tradition and individual story. Through the interview survey, Taiping local people shared the notable past events in Taiping and the impression to remember Taiping as a mining town. The cultural events celebration such (Lunar New Year, religious event and Lantern Festival), historical event (Queen Coronation and Taiping Centennial), and the impression Taiping Lake Garden is the historical denotation of Taiping mining town (Figure 6.6 and Figure 6.7).

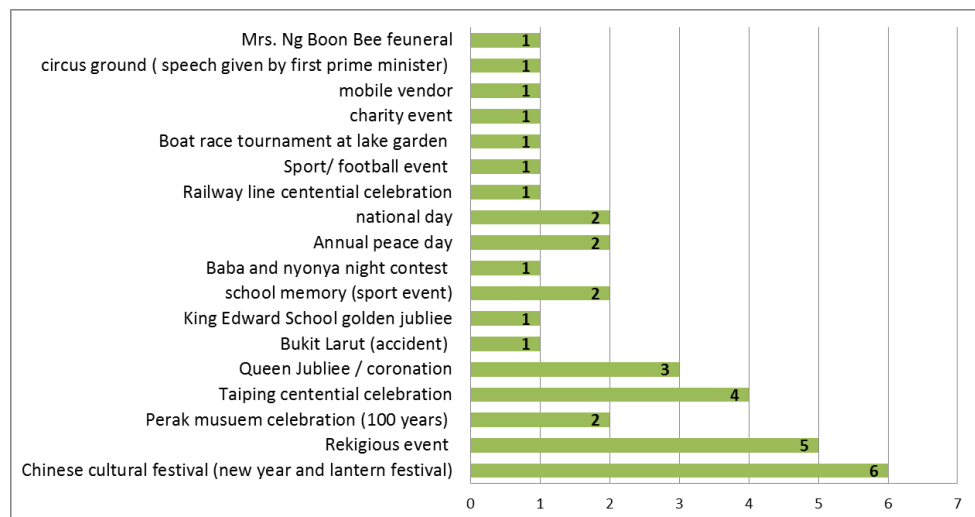


Figure 6.6: The memorable event executed in Taiping town (Author 2014).

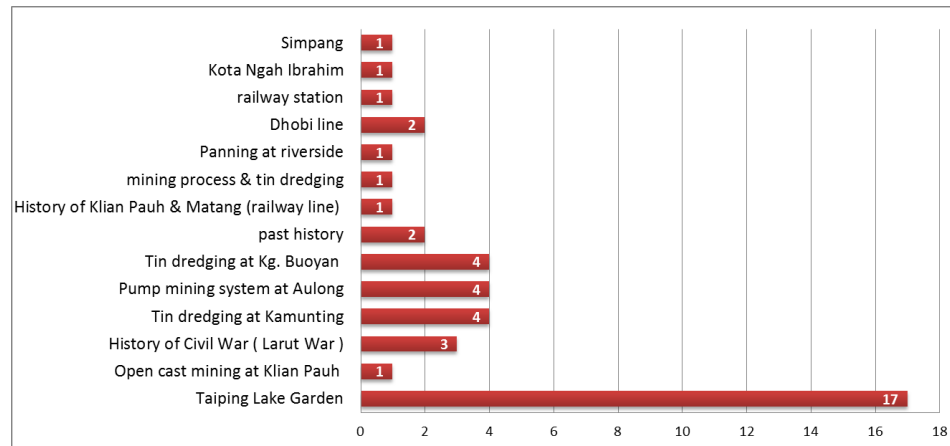


Figure 6.7: Local impression of Taiping as a heritage mining town (Author, 2014).

6.3 Other suggestion for tin mining town heritage conservation

The ex-mining town and its cultural heritage are the most concern to the historic town and industrial mining landscape urban conservation. Therefore the category of mining town relics heritage conservation inscribe as the followings;

6.3.1 Preserving the post-colonial planning and heritage townscape of a mining town

6.3.1.1 The drainage system and man-made lake garden

The drainage system in Taiping downtown combines with the man-made pond of Taiping Lake Garden for the water drainage system. The inheritance post-colonial sanitation planning is imperative to keep the cleanliness and hygiene living environment as well as for flood prevention in a tin mining town. Local municipal council proposed the implementation of drainage system maintenance in Taiping downtown and the reconstruction of underground drainage at Taiping Lake Garden.

Suggestion:

- i. Remain and minimise the changes on water catchment pond at Taiping Lake Garden.
- ii. Preserve the British colonial drainage lines and the Lake Garden catchment ponds yet to show an ex-mining small town in promoting healthy sanitation for a living environment as well as to overcome the overflow rainwaters to reduce flash flood problem.
- iii. Adaptive reused the ex-mining pond to consider for the stormwaters management. Meantime, the rehabilitation of the ex-mining pond turned into a wetland or recreational pond may enhance the physical environment of a mining town.

6.3.1.2 Protecting the natural landscape of a mining town

The natural or semi-natural landscapes had signified the distinct character of Malaysia mining town's setting when integrated into the mining landscape. In another word, the regional mining landscape preservation specifies to the integral landscape component that connected tin industry and the mining town development.

Suggestion;

- i. The limestone cave, river (Ipoh) and valley landscape of a mining town (Kinta Valley and Sungai Lembing) imperative for to show the geography setting of a mining town built in the valley, the foothill, or enclave by limestone cave. Moreover, the river supported the tin industry as the water transport, the water source for tin mining and tin panning during the heydeys of the tin mining operation.
- ii. The visual character reveals of the geology mining (underground mining tunnel) or the relic mining landscape (mining site) should remain as a part of the physical evidence of the post- mining industry.

6.3.1.3 Heritage townscape conservation: adaptive reused the heritage tin industrial structure and building

The adaptive-reused of pre-war buildings or the old shophouses convert into an industrial museum. For instance, the Papan tin mining town is now in the laidback condition, many old shophouses abandoned in Papan tin town. It is to recommend the conversion of the heritage shop houses into the gallery or other commerce usage related to the tin town heritage approach and at the same time it may be contributed to the economic revenues. Besides, it helps to enhance the heritage tourism-based on tin town revitalization that had been doing by Gopeng Museum and gallery.

Suggestion

- i. Incorporate the industrial heritage into the new development for the historic townscape or the urban landscape. Preserve the remnant tin industrial heritage structure such as Gopeng giant pipeline and tin dredge. Alternatively, the reused of mine structures turn into the open museum at the existing mining site such as the tin dredge restoration or the underground mining tunnel. At present, Sungai Lembing mine had open to the public for experiences and discovered the tunnel underground mining setting.

- ii. Preserving the landmark viewpoint of a tin mining town is essential for the visual cue and legibility. In such, the building profile and building height should not obstruct the view of the historic building or monument; maintain the heritage trees, streetscape and sculpture.

6.3.1.4 Creating awareness for local on heritage conservation

Through the interview survey (refer to the discussion in Chapter 4), the result revealed 89 percent of local people in Taiping do not participate in heritage conservation programme. Therefore, the heritage awareness through public education is essential to increase local people cooperation and responsibility on heritage mining town conservation.

Suggestion;

- i. Interpreted the heritage conservation awareness thru educational approach may support the local and school children to comprehend the vitality of heritage conservation as a part of their responsibility to upkeep the tin town relics. Therefore, to propose an educational centre related to the heritage town and tin industry heritage conservation to let local people or visitor participate thru the heritage conservation programme.
- ii. The cooperation between the experts from Government Council or Non-Government organisation (NGO) with the empowerment local communities for heritage conservation workshop or seminar.
- iii. Through the revitalisation on the local cultural and social events of the ethnic association is to preserve the historical sense within the communities' heritage tin town.

6.4 The heritage meaning of Taiping mining town in comparison to other mining cities

Initially, the historical fact had insertion Taiping mining industry impetus in Malaysia and Southeast Asia regions (South Sea or 'Nanyang') history. The tin industry revolution attracted Chinese immigrants' influxes into the Malayan tropical hinterland. Through the Pangkor Treaty Agreement signed in 1874, it was the first British colonial intrusion in Malay

States politic, and subsequently, Taiping was built and re-planned by the British colonial in the 1880s. Larut tin mines (mines: Taiping, Kamunting, Topai and Klian Pauh) had contributed to the early tin export in Malay Peninsula before Kinta Valley founded. Taiping underwent a modern urbanisation in 1882 comparable to Kuala Lumpur tin town which is not fully developed at that time (Taiping Municipal Council, 2013). Taiping selected as the first capital of Perak State and driven to rapid development when Larut mining expansion from the mid-19th to 20th centuries. Later, the tin mining town is developed into a commercial and administration centre. Despite the fact, the presence of linear industrial infrastructures of Larut River functions as the vital water transport before the first railroad (Taiping to Port Weld) built in 1885s connected to the seaport. Hence, the entire industrial heritage development in Taiping is contrasted with the entrepot cities of Strait Settlements (Melaka, George Town and Singapore). Also, the British colonist established the 'tin states' regions or the Federated Malay States (FMS) in the Malay Peninsula for the tin traded governance.

Though Taiping tin mining operation was in a short period circa 60 years, yet today the 140 years glories and heritage mining town is standing as the oldest tin town in Malaysia. By the history and industrial heritage studies, Taiping and Larut mines adopted the ancestral (1800 -1840s) and open cast mining method (1850-1900). Therefore, the manpower tin workers needed for the open-pit mines and forest clearance are recruited by the Chinese Kongsee and secret society. When come to the 20th century, Kinta Valley mines discovered by the European capital and investors, therefore, the mining technique had expanded to attain higher mining technology by using hydraulic power and bucket ladder dredge distinguish to Taiping. The mining technology in Iwami Ginzan Silver Mine in Japan develop in small-scale landscape labour intensives that covering the entire skills from digging to refining was successful developed (Shimane Prefecture Board of Education, 2008). On the other hand, Taiping is also differing from the remote part Sewell mining town (Chile) contributed to the world largest scale copper mining technology. The Rammelsberg mines, Historic Town of Goslar (Germany), City of Potos í(Bolivia) and Røros Mining Town (Norway) invented in the water management system implemented in mining technology which opposition to Taiping mines where the open cast mining directed water source from the river or mining pond.

For that reason, Taiping mining town development is not about the growth of mining technologies aforementioned in the case of Kinta, Iwami Ginzan, Røros Mining Town and Sewell mining towns. Nonetheless, the settlers of manual tin workers and railway builders imperative to shape Taiping's industrial society. Indeed, the successive Taiping town expansion was parallel with the plural society formation during the tin industrialisation eras

under British colonial ruled. Therefore, the heritage significance of Taiping mining town constitution of the tin industrial infrastructure, seaport, colonial townscape (British administration centre, quarters and hill station), social infrastructures and the Chinese town (old shophouses and townhouses). In this aspect, Taiping mining industrial infrastructure development have the similarities to Cornwall and Devon mining landscape in Britain. The Cornish mines transformations covered large regions associated with the rural landscape and the erection of industrial infrastructures such as smallholdings, railway, canals, dock, port and town. Wherein Taiping small tin town remarkable the changing landscape of the alluvial plains to form the tin settlement and urban landscape. In the same period, Taiping Township had reached the fundamental influences on British colonial town planning inscribed in 'Grand Modell' (Home, 1997). In another word, the layout of Taiping tin mining town possession for the colonial political control, tin economic and erected by social structure from the multi-ethnics.

British colonisation has strongly influenced Taiping's urban form and spatial pattern. By the means, the colonist had made up their territories in Taiping mining town with separation inhabitants and meanwhile the settlers of diverse cultural backgrounds had organised their social spaces in the tin settlement. This interesting phenomenon has remained Taiping with the western town planning combinations of eastern architectural and townscape. Herein, the social and cultural background had imbued into development pattern of Taiping townscape (such as clans associations, old shophouses, little India, and Dhobi line). Besides, the heritage values of colonial town planning through the interpretation of ex-mining land and ponds had turned into a lake garden. In fact, the man-made lake and the open drainage system in Taiping downtown used to control overflow rainfalls. The western planning features interpretations of gridiron streets, Padang (public square), green open spaces, thoroughfares, English landscape, and colonial architectural again to reveal Taiping land use planning claims a the early model of an urban small mining town in Malaysia.

The virtual heritage meaning of Taiping tin town is bringing another perspective to look other mining town or landscape shared the common and divergence characteristics. Taiping town strategically located at the tin lodes setting and closed to the western coastal line (seaport) is imperative for the tin industry operations. The multi-cultural heritages consisted of European, past tin industrial societies (Eastern cultural) and native compositions influenced to the tangible and intangible heritages evidenced by such religious buildings, clan association, shophouses, and social spaces. The heritage significance of Taiping tin town presents the formality of colonial grounded as the industrial town where the very clear proportion land uses

divisions on a tin settlement, industrial infrastructure and transportation. Eventually, the post-colonial landscape planning enhanced the pleasant living milieu in current Taiping with the greenery lake garden that was also playing the main role for the stormwaters management with the downtown drainage system. In the nutshell, Taiping inheritance the greater heritage on colonial town planning that influenced on the tin settlement pattern. The physical heritage determined the heritage attributes of Taiping mining town and historic townscapes testify through the industrial heritage, post-colonialism and planning, and the cultural diversity (Figure 6.9).

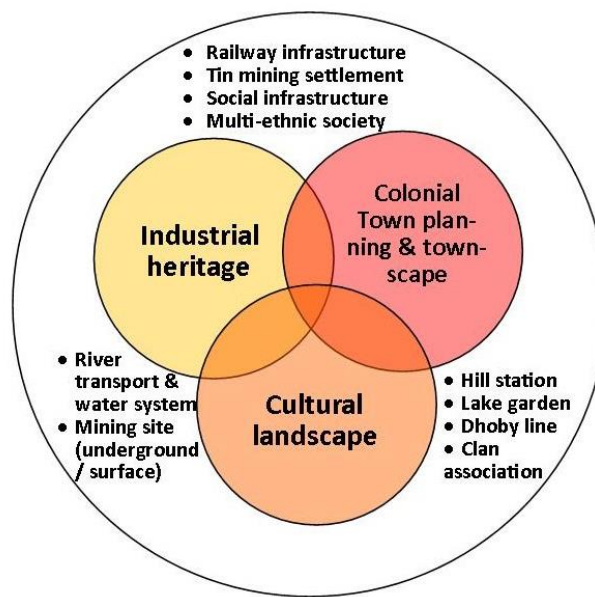


Figure 6.6: Taiping tin mining town manifested by industrial heritage, cultural landscape (mining landscape), colonial town planning and townscape characters.

In summary, the ex-mining town had a greater heritage value compared to the UNESCO World Heritage Sites that assessed the heritage cultural criteria such as the industry worker house, furnaces, transportation routes, and the mining site. It is because there is no physical evidence of smelting hut or house existence to indicate where the actual tin smelting activity worked in a small kiln by Chinese smelter firm in Malaysia's mining settlement. Many tin smelting processed in Penang and Singapore Strait Settlements tin smelting factory and consequently for the tin export after the raw tin refineries for the 'strait tin' substance. Furthermore, many ex-mining grounds in Malaysia were operated through the surface mining (open cast mining technique) except the underground mining shaft in Sungai Lembing. This is why; the lack of ex-tin mining site veracity to a testimony of tin industry archaeological properties. Most of the ex-mining lands and mining pond had converted into a new land use developments such as housing estates, resort, agricultural, University campus ground and

another commercial mix. Therefore, the preservation and conservation of heritage tin mining town and historic townscape in Malaysia are vitality to reaffirm the historical datum of physical and social entities for ex-mining town and post- industrial landscape.